# Municipal Journal

Volume XXXIX

NEW YORK, DECEMBER 9, 1915

No. 24



CLAREMONT AVENUE, MONTCLAIR, PENETRATION MACA DAM LAID IN 1915, USING S. O. BINDER C.

#### PAVEMENT MAINTENANCE IN MONTCLAIR

How a New Jersey Town Keeps Old Macadam Roads in Good Condition Under Heavy Automobile Traffic—Patching Holes—Skin Coat to Reduce Wear—Resurfacing with Penetration Macadam—Patrol vs. Gang System.

Montclair, N. J., is a residence suburb of New York with a population of about 25,000, which is increasing about one thousand per year. It is under town government and its problems are largely those of a town or small city of high-class residences. The roads and sewers are in the charge of the town engineer, who has as assistants for this and the general engineering work of the town, and the special work of a complete town survey, a town surveyor, two assistant engineers, a designer, a draftsman, transitman, three rodmen, two chainmen, two axmen, and two inspectors. The total payroll for the engineering department employees was \$16,617 in 1914, in addition to the cost of inspectors.

Most of the streets of the town are paved with clay-bound macadam, there being about 60 miles of this kind of paving. In addition there are about 9.5 miles of dirt roads, of which 2½ miles are surfaced with ashes, 1½ miles of granite block, a small yardage of wood block, asphaltic concrete and bitulithic, and 3 miles of bituminous macadam (penetration method). The granite block was laid by the county (the town paying part of the cost) as a section of a county highway from Newark north and

west across Orange Mountain, all of which was paved with granite block, making a continuous stretch of this pavement about 6 miles long. This removed one of the most serious problems the town had formerly to contend with—that of maintaining, or rather getting the county to maintain, a macadam pavement on a heavily traveled main thoroughfare which was the business street of the community.

The dirt roads are given little attention, and require little, as they receive only local travel. The ash roads are oiled, which treatment has proved quite satisfactory. They are packed quite hard soon after traffic has been turned onto the spread ashes, and one-half gallon of oil per square yard serves to keep the dust down; more satisfactorily, in fact, than even a greater amount of oil on a clay road.

The clay-bound macadam, constituting 80 per cent of the streets, presents the most important problem. Most of the road work carried on by the town engineer (who has charge of all such work) during last year and this has consisted of oiling practically all the clay-bound macadam roads and trying to keep them in good condition by patchDuring the year 1914, 52.6 miles of streets were oiled at least once, about half of them received a second coat, 3 miles were oiled the third time, and 1 mile a fourth time. Altogether 710,000 sq. yds. of oiling was done, at a cost of \$8,000, or an average of 1.1 cent per square yard. The oil was furnished by the Alden Speares' Sons Company in tank cars, f. o. b. Montclair, at 5.1 cents per gallon. This company was the lowest of only two bidders who

ing, there being practically no funds for new construction.

offered to furnish oil containing no paraffin scale. The gravity was 23.2 Beaume; specific gravity, .915; solubility, 86° naphtha, 89.35 per cent. The oil was applied by gravity distributors. All oil is bought by the town in tank cars, which are run onto a trestle and the distributing tanks filled by running them under the trestle and filling them by gravity. A tank car will usually be emptied in

The oil used during 1914 cost \$6,602.22; the teaming to distribute it, \$417.51; and the labor, \$218.67. About one-fifth of a gallon per square yard per oiling was used on

the clay-bound macadam.

During 1915 the oiling cost only \$4,080, a large part of the reduction being due to the fact that, by taking advantage of a time of low prices, the oil was obtained at 3,1 cents per gallon, or 60 per cent of the price paid in 1914. The oil used was a Mexican oil furnished by John Baker, Jr. Less oil was required per square yard because of the fact that last year clay, used as a binder for patches, was scattered over the street, while this year asphalt was used as a binder. Also only 6 to 8 miles of streets needed to be oiled the second time and none a third time. A few more miles were oiled this year than in 1914, in spite of which the labor cost only \$173.14, the teaming only \$340.68, and the oil \$3,225.45.

The maintenance of the macadam roads consisted of patching and resurfacing. The former was done by patrol work in 1914, but by gang work this year. For patrol work the town was divided into ten sections and in each were placed two men, one a common laborer, the other a man of some experience on road work. Stone and clay were used to make the patches, and the materials needed were delivered by a team and wagon, one team serving two and sometimes three sections. It required about six weeks for each patrol to do all the patching in its section, before which time the part first repaired was in bad shape again. In fact, the patching with clay binder was not a success, and the clay was scattered over the street, absorbing an unnecessary amount of oil used in oiling the streets and occasioning demands for more frequent oiling to lay the dust caused by the clay. The men, being scattered all over town, could not be looked after systematically and

shirked their work. Moreover, the teams lost considerable time delivering material to so many scattered gangs. This work cost \$7,500 in three months, with the roads at the end of that period in poor condition to last the winter. The patrol system was therefore abandoned, the worst places only were kept patched, and the remainder of the year's budget allowance was devoted to applying a skin coat of asphalt to the surface of as many roads as possible. This consisted of spreading by hand Alden Speares' 90 per cent asphalt oil, covered at once with half-inch stone. Sand was spread over this and it was rolled with a 6-ton tandem roller. This gave excellent results, on the whole, but on some streets subjected to heavy traffic and where sand was excessively applied to remedy bleeding and against the advice of the engineer, the surface developed a wavy condition, which was predicted by the engineer before the sand was used.

Instead of the patrol system, in 1915 the town was divided into three sections, with a foreman in charge of each. Each foreman has a gang of 12 or 14 men, all working together and under the foreman's eye. It is believed that by this system the men do double the amount of work that they did by the patrol system. The patching this year is done with stone mixed with bituminous cement at a central point and delivered on the street where needed. For cement, H. G. R. No. 1 was used (obtained from the Headley Good Roads Company), costing 63/4 cents per gallon, f. o. b. Philadelphia in tank cars. The stone used was trap, 1/2-inch, with 3/4-inch added for deep holes. Fifty gallons of the binder were mixed by hand with 7,000 pounds of trap stone; the stone being spread out level, the binder poured on by hand, and the stones then turned over by shovel. (Machine mixing would probably be cheaper, and will be used during 1916.) In applying the stone thus prepared, the hole is cleaned of dirt and loose material, the prepared stone spread, and rolled. In some cases the depression has worn so large that the patch extends the full width of the paved strip of the roadway, which is generally 18 feet. Including cost of materials and an average haul of two miles to the street, this cost about \$7 for the amount above described. Fiftyone thousand gallons of binder were used this year in preparing patching material in this way. This material seems to be just about as durable as the clay-bound macadam which it is used to patch, and therefore does not either rise in humps above the pavement as the macadam wears down, or wear more rapidly and produce holes again. During 1915, \$18,000 has been spent on patching and \$9,700 on resurfacing; the latter being what could be spared after paying for the necessary patching.

In resurfacing clay-bound macadam, the road is first



PARK STREET, MONTCLAIR. SKIN COAT LAID IN 1914.

broken by use of spikes in the roller wheels and is then scarified by a Buffalo-Pitts scarifier dragged by the roller. The surface is then leveled off and a layer of 1½-inch stone is spread and rolled with a roller weighing about 15 tons when loaded with coal and water. Binder is then spread with hand distributors, 1¼ gallons to the square yard. Following this, a layer of ¾-inch stone is spread and rolled, and 1 gallon per square yard of binder is applied. On this is spread ½-inch stone and the road is given a final thorough rolling. A little over two miles of this penetration work was done this year.

The asphalt used for the resurfacing described was Standard Oil Company's Binder C, for which 3.55 cents per gallon, in tank cars f. o. b. Montclair, was paid. This asphalt has a specific gravity of 1.022. Penetration at 72°, 68; at 32°, 22. Ductility at 77° F., 100. It contains 1.35 per cent paraffin scale. The rock (trap) cost, delivered on the street, \$1.22 per ton for 1½-inch; \$1.27 for ¾-inch; \$1.57 for ½-inch stone. The price for each was 37 cents less at the quarry.

The cost of the penetration resurfacing, including scarifying and all other labor, materials and overhead charges, averaged about 45 cents per square yard 3 inches deep.

The town engineer, who has had charge of all the road work since he assumed the office at the beginning of 1913, is Edgar S. Closson, and to him we are indebted for the above information.

#### SAND TESTS FOR ROAD WORK.

The New York State Highway Department makes quite thorough tests of all materials used in state road construction, and considers those for sand and stone fully as important as the tests for cement or bituminous materials. In testing stone, the determinations made are gravity, absorption, coefficient of wear, hardness and toughness. In order to compare the desirability of certain stones, the French coefficient of wear, being considered the most important and reliable, is given a weight factor of 3, hardness is given a factor of 2, and toughness a factor of 1. The sum of these three weighed results gives the weighted value of each of the stones tested, for comparison of their value as road material.

"The test for sand is not quite so elaborate as that for stone, but as there is great variation in the supply obtained in many cases, we have provided kits for men in the field which enable them to check the loam determination and also to make some of the mesh analyses. With sands the following determinations are made. Per cent of loam and its occurrence, that is, whether it occurs in free state or has a tendency to coat the grains; the effect of washing upon the sand; percentage of voids by mesh analysis, using the following sieves; ¼, No. 6, No. 20, No. 50, No. 100 and No. 200. The natural and washed sands are also made up into 2-inch cubes for compression tests, using a standard brand of cement. At the same time we make a compression specimen, using the same cement and a 20:30 Ottawa sand. The results obtained on the natural and washed sands at the end of 7 and 28 days are compared with results obtained on the specimen made, using the Ottawa and as a standard, our requirements being that the natural sand, if it is to be used in any of our concrete pavements, shall show a compression at least equal to that of Ottawa sand. It must also be free from organic matter and reasonably free from loam, our specifications stating that 5 per cent of loam will mean rejection. Sand used for other structures, such as culverts, foundations, etc., must show a compression strength of at least 80 per cent of that obtained with Ottawa sand.

"This elaborate detail test of sand may appear to be useless work, but it has been proven by results obtained that in order to have successful concrete pavements, the sand forming the matrix must be as carefully and judiciously selected as the cement that forms a part of the same. Our experience has been that many failures in this type of construction are entirely due to poor sand. Concrete, to withstand abrasion and tensile and compressive stresses, is only as strong as the matrix composing it. The inconsistency of present-day practice is shown by testing the one important ingredient (cement) with a fine degree of precision, and trusting the other equally important ingredient (sand) to visual guesswork."

#### SUPERVISION OF HIGHWAY WORK.

In a paper before the Pan-American Road Congress, Prevost Hubbard, chief of the Division of Road Material Tests and Research, Office of Public Roads and Rural Engineering, U. S. Department of Agriculture, emphasized the importance of careful and thorough expert supervision over construction work on highways as being fully as essential to good work as the preparing of specifications. Said he: "The desire to reduce the cost of engineering supervision to a minimum, even at the risk of inferior supervision, frequently proves to be the poorest sort of economy. Far too often elaborate specifications are prepared and never enforced through lack of laboratory assistance. A specification is of little value to an engineer unless he has means at his disposal whereby he may determine that his specifications are met; and yet in the author's experience many cases have come to his attention where, for instance, no examination is made of bituminous materials whose chemical and physical characteristics are nevertheless specified in detail. It does not take either the manufacturer or the contractor long to 'size up' such a condition of affairs, and no matter how honest they may be in intent, the work is likely to suffer in more ways than one."

The author referred to an instance in which a bituminous pavement had failed shortly after construction, although but little fault could be found with the specifications. It developed, however, that the highway engineering supervision for the city amounted to less than 2 per cent of the cost of the work involved, a fact of which the city engineer appeared to be very proud. For that particular type of construction, the cost of adequate laboratory inspection alone should not have been less than 1½ per cent. This experience alone cost that city several thousand dollars which could have been entirely prevented had a laboratory been used as an adjunct to the engineering supervision.

The municipal laboratory should be in charge of a capable chemical or testing engineer, who should have ample opportunity to familiarize himself with all of the local conditions to be met in his municipality, and for studying the behavior under practical service conditions of the materials tested. "His advice and co-operation should be sought by the chief engineer, who should also keep in close touch with, and understand the work of, the laboratory. Too often the chief engineer fails in one or both of these particulars," and the work of the laboratory is allowed to degenerate into purely machine-like routine. The full benefit of the laboratory will be obtained only when the one in charge keeps in touch with the actual performance under local conditions of materials which he has inspected. But even before this knowledge can have been obtained, or if it never is obtained, the laboratory is still worth more than it costs in securing enforcement of the specifications.

#### TRACTORS AND TRAILERS IN MUNICIPAL WORK

Increasing Transporting Capacity and Decreasing Idle Time of Motor Trucks by Use of Trailers—Examples of Use in Several Cities.

Motor vehicles have now come into general use in municipal work and a great many cities are using motor trucks in one capacity or another. Carrying garbage or refuse from collection stations to dumps or reduction plants outside the city, street cleaning, flushing, street repairing and general utility work are a few of the uses to which they are being put by municipalities. In the allied lines of contracting and construction they are used to a still greater extent and motors for hauling in road or other construction work are common. In business, where there is a wider field, the use of the motor truck has grown to enormous proportions.

Owing to the comparatively high daily cost of operating a motor truck, it has happened in some cases that they have proved to be less economical than horses. One truck represents in value several teams, and costs for operation as much as at least two teams and must do more work if its use is economical, carrying the same load more miles per day or a greater load the same distance. Also, since a large proportion of the cost of a truck is the same whether running or not, delay in loading or unloading has a considerable effect on the unit costs. In places where devices for rapid loading and unloading have cut the time lost to a minimum, trucks have repeatedly proved to be more economical than have horses.

Many methods for saving time have been tried. On some of the subway work in New York City, large skips holding three or more yards are loaded, already filled, onto the truck by cranes and unloaded the same way. Special bodies for holding the skips have been placed on some of the trucks in order to facilitate handling. A successful application of this method was described in Municipal Journal, August 6, 1914. On this job trucks operated profitably on hauls ranging from 1,200 to 4,000 feet.

Another method now being used to a considerable extent is that of attaching trailers to the motor trucks or to especially constructed tractors. This method has

many advantages. In places where rapid loading is impossible, a trailer may be left behind to be loaded while the tractor takes a filled one to the work. Also, since the use of the trailer is simply an application of the principle that more can be hauled than carried, and since the truck either loaded or empty has sufficient tractive power to pull one or more trailers, the load may be increased. Tractors are also used where the loads to be carried are large in bulk, but of small weight, so that a body full is only a fraction of a truck's capacity.

Other advantages claimed for the tractor and trailer method are that the bulk of the paying load rolls on steel tires, that the power used—the tractor—may be transferred from one type of work to another merely by interchanging trailers, and that the trailer method makes possible the highway transportation of girders, long timbers and other like commodities, usually difficult to handle. Also, costs are reduced, since the use of a trailer of the same capacity as that of the truck increases the cost of operation of the truck only slightly.



Courtesy, Commercial Vehicle.

MACK 7½-TON TRACTOR WITH SPECIAL SEMI-TRAILER
CARRYING SKIPS FILLED WITH ROCK FROM
NEW YORK SUBWAY.



Courtesy, Commercial Vehicle.

PEERLESS SIX-TON TRUCK AND TWELVE-TON REVERSIBLE TRAILER, DETROIT.

Truck Provided with Crane, Hauls Detroit's Garbage from Sub-station to Railroad.

The first advantage claimed is somewhat offset by the fact that, though they cost more, rubber tires on a trailer wear 60 per cent longer than steel tires.

There are four types of trailers, but only two are in general use for heavy hauling: the 4-wheel trailer and the semi-trailer. The first is sometimes built up from an ordinary dump wagon and is connected to the tractor by a pole or other similar arrangement. The semi-trailer has the front end resting on the rear of the tractor. In considering which of the two types is most suitable, attention must be given to the traction problem and to the easy management of the outfit by the driver.

The semi-trailer, where part of the load is carried on the driving wheels and part drawn behind, is economical and efficient. The weight capacity of the truck is doubled, there is sufficient weight on the rear wheels of the tractor to give traction under practically all conditions and the outfit can be backed into position by one man without difficulty. If necessary, the trailer can be jacked up and left standing while the tractor is after another load.

Using 4-wheel trailers, several may be attached to one tractor, in which case all the load rolls on the trailer tires. There is also the advantage of less wear on the rear tires of the tractor and the fact that the trailer can be uncoupled and left standing at any time or place. But they are difficult to manage in steering or backing, and the absence of sufficient weight on the rear wheels of the tractor is liable to allow the wheels to slip in wet or icy places.



Courtesy, Commercial Vehicle, KNOX SEMI-TRAILER ON SNOW SHOES IN SPRINGFIELD, MASS.

While any motor truck may be used for a tractor better results are obtained when the tractors are built especially for the work. Short wheelbase, short turning radius, extra-low gear and a four-speed transmission with direct drive on third speed are desirable features. A larger cooling system than is ordinarily furnished on motor trucks is also an advantage.

It is estimated that there are now 10,000 trailers in use in the United States. Few municipalities have made use of them as yet, except in the fire departments, where they are used to a considerable extent. Here they effect a considerable saving, as by their use horse-drawn apparatus may be motorized at a cost small compared to that of entirely new motor apparatus. Tractors on road work, and similar construction jobs are common.

Detroit, Mich., uses motor trucks to convey its garbage from the collection sub-stations. One hundred steel boxes are used to hold the garbage. These boxes are loaded by crane, four on a Peerless 6-ton truck and four on a Detroit reversible 4-wheel trailer, and hauled to a railroad station for shipment by rail to the reduction plant outside the city.

Cincinnati some time ago decided to look into the merits of the gasoline tractor for municipal hauling. A test was made to determine how much a tractor could haul, whether several trailers could be handled conveniently at once, whether the tractor could work on grades as high as 8 per cent and whether the tractor brakes could hold back the combined weights of several heavily loaded trailers coming down this grade. Gilbert hill, which is 7,000 feet long with a mean grade of 6.2 per cent, a maximum of 8.3 and a minimum of 1.8, was chosen for the test. The hill is paved with granite blocks A Knox tractor and six ordinary city dumping wagons for trailers were used for the test. The city authorities specified that there should be no load whatever over the rear axle of the tractor and the test was therefore made with the entire load rolling on steel tires. The six trailers were loaded with mud, the entire load being 38,550 pounds. The train was started at the bottom of the hill, made the ascent, turned at the top without stopping and returned to the foot of the hill. In coming down the grade, the entire load was held back by the tractor only, the brakes on the trailers not being set. Two complete stops were made on the steepest part of the hill, showing that the load was under complete



TRACTOR AND LOADED TRAILERS DESCENDING 7.8 PER CENT. GRADE.
Total Weight, 38,550 Pounds. Speed, 3 Miles Per Hour. No Brakes Set On Wagons. Knox Tractor.



"QUAD" TRUCK HAULING BAIN TRAILERS.

control. The weights hauled in the test were 25 per cent in excess of any loads hauled in city work in actual service. The city purchased this tractor, it having ing complied with the requirements.

Tractors and trailers have been successfully used in Springfield, Mass., also to haul hot asphalt from the city plant to Indian Orchard, seven miles away. The trailers used were of the ordinary bottom dump type. Part of the time three trailers were used, the first carrying 8 tons and the other two 2½ tons each, a total load of 13 tons. A large part of the haul was over hills, there being a long stretch of 6 per cent grade. The average running time for the seven miles was one hour.

New York City is using tractors and trailers in connection with the Manhattan municipal asphalt plant. Semi-trailers are used, each weighing two tons and carrying 6 or 7 tons, about 30 per cent of which is carried by the tractor. Fourteen trailers and six Saurer tractors, are now in use and bids have recently been received on seven more trailers. One of the tractors is kept employed at the yard all the time. The use of these trailers and tractors saves \$60 per day over the use of horses, it is estimated. Prior to the adoption of this method of tractor-trailer hauling, it had been thought that motor vehicles could not operate economically on this type of work, due to the time lost in loading and unloading. By using the steam roller to move the trailer while at the job and having the trailers at the plant loaded and ready for the tractors, no time is lost. The trailers were built especially for the work and are equipped with small chutes on the under sides from which the mixture may be shoveled in any amount desired for patching work. The trailers were made by the Watson Wagon Co. A description of the Manhattan plant methods and of the tractors and trailers was given in Municipal Journal, Nov. 4.

The New York Street Cleaning Department uses tractor-trailer outfits in collection work in the "model district." In making up the plans for this model district, in which it is intended to use the most modern types of equipment, it was necessary to provide 12 tractors and 36 trailers, equivalent to 36 single function trucks, to replace horse drawn equipment. The adoption of this method, it is expected, will decrease the fixed charges for the coming year by extending the functions of the trailers and hours of work of the tractors.

Each tractor is provided with three types of trailers: for refuse collection, street cleaning, and snow work. For refuse collection, a trailer body fitted with removable compartments to hold 10 cubic yards of refuse is used. All classes of refuse are collected at one time and only one trip per day is made through any street. General Vehicle gas-electric tractors are used on this work. In Brooklyn, a Knox 3-wheel tractor with a large steel body semi-trailer is used for hauling refuse from the loading station in 20-ton lots.

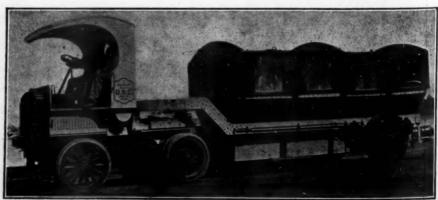
The Department is planning to use, for cleaning New York streets, a trailer carrying a water tank holding about 1,500 gallons, with sprinkling, flushing and revolving broom

attachments; and for snow work, a plow and revolving broom, following street railway practice.

The Water Department of Lynn, Mass., used a White truck with 2-wheel trailer for hauling 36-inch water pipe during 1914. The average haul on this job was 6.5 miles, and the cheapest bid for horse hauling was \$2 per ton, or 30.8 cents per ton-mile. It was believed, however, that the hauling could be done more cheaply by motor truck and one was purchased. In order to utilize the equipment to the utmost, a 2-wheel trailer was drawn behind. In this way three lengths of 36-inch pipe were carried at once, two on the truck and one on the trailer. Two trailers were used, one being loaded while the other was on the road. The pipe was delivered over fair macadam roads with grades varying from 4 to 8 per cent and over distances of 6 to 11 miles. The average round trip was 16 miles and the truck made three or four trips per day. The average tonnage per trip was 5.28 tons and the haul 7.875 miles. The truck averaged 4.49 miles per gallon of gasoline and the cost per ton-mile was reduced to \$0.151. The truck averaged 41.5 miles per day for 211 days. Complete costs and a description of this work were published in Municipal Journal, February 25, 1915.

In asphalt work the Borough Asphalt Company of Brooklyn uses a Saurer 5-ton tractor-trailer outfit, the trailer being a 2-wheel, steel-tire, special dumper of 5-ton capacity (100 cu. ft.) and costing \$1,200 each. They are equipped with Wood hydraulic hoists and dump from the rear. Seven Saurer tractors and several extra trailers are in use and are giving excellent results.

A "Quad" truck, manufactured by the Thomas B. Jeffery Company, of Kenosha, Wis., was used as a tractor, pulling two Bain trailers on concrete road work in Wisconsin last fall. Prior to the purchase of the truck, it was given a test of one day, during which it demonstrated that it could do the work of from six to ten



NEW YORK REFUSE COLLECTION TRAILER AND GAS-ELECTRIC TRACTOR.



Courtesy, Commercial Vehicle.

KNOX THREE-WHEEL TRACTOR WITH LARGE STEEL SEMI-TRAILER FOR HAULING GARB AGE AND ASHES, FROM BROOKLYN, N. Y., LOADIN G STATION.

CAPACITY, 20 CUBIC YARDS.

teams. Previous costs for hauling on this work, where the round trip was 5.4 miles, over bad roads, totaled \$1 per yard for horse hauling. Nine or ten teams had been employed at \$6 per day each, the teams making four trips per day and carrying 1½ yards each trip. By providing several additional loaders and using four trailers—two being loaded while the other two were being hauled out and dumped—the truck with trailers was able to make 12 trips a day. An extra team was used to turn the trailers, the road being narrow, and the chauffeur did nothing but attend to the driving. By speeding up in this way, the truck was able to make twelve trips per day, carrying 1½ yards each trip and hauling two trailers, each with 1½ yards, a total of 54 yards per day. This is equivalent to the work of nine teams.

In assuming costs, fixed charges, including depreciation, interest, etc., were estimated at \$5.17 per day for the truck and \$0.88 for the trailers; while the variable cost per mile for the truck was estimated at 10.85 cents per mile and 2.3 cents for the trailers. In making 5 trips per day of 5.4 miles each, the total cost for hauling and carrying 22.5 yards was \$11.60, including the cost of extra loaders, a saving of \$10.90 over horses; for 8 trips with 36 cubic yards, the cost was \$15.73; and for 12 trips with 54 cubic yards the cost was \$18.57. The resulting costs per ton-mile include the pay for extra loaders, but not for the loaders used for horse hauling.

#### JOINT FILLERS FOR GRANITE BLOCK.

In a paper by C. D. Pollock, presented under the above title in our issue of November 18th, attention was called to the importance of insuring that the cement grout filler filled the joint entirely to the bottom; the result of its failure to do so being, in some cases at least, a splintering off of the tops of the blocks.

Through the courtesy of Mr. Pollock we show below, two photographs illustrating this. In the smaller one, fine gravel can be seen rising entirely to the top of the blocks in several places—two joints at the bottom, and one just left of the center being prominent. This condition would of course prevent a full grout joint. In the larger picture is seen the effect of one such joint. The edges of blocks at two joints have been broken off and the splintered edges rounded off by traffic. This pavement is otherwise in good condition, except that the grout in the joints, which was placed in cold weather, froze and disintegrated in the top ½ or ½ inch of depth.

#### CITIES MAY SELL ELECTRIC FIXTURES.

The supreme court of Michigan has decided that municipalities of that state can engage in the business of selling bulbs, electrical apparatus, electrical appliances, etc., and wire houses as well. An electrical appliance dealer of South Haven complained that the city was injuring his business by competing. His contention was that, under the state constitution, while the city had a right to own and operate a lighting plant it could not go into any private business. The court, however, in an opinion written by Justice Kuhn, holds that, although the constitutional provision does not say exactly that the city can only own and operate, common sense will permit the city to make the proper sales of such things as will enable the consumer properly to use the current. The case of electricity differs from that of water, the court says, the state in which it is delivered over the wires making its use impossible directly.

#### PAYING CONTRACTORS IN MUNICIPAL PAPER.

New York, December 7, 1915.

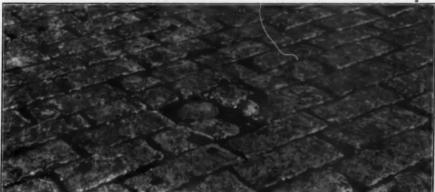
Editor of the Municipal Journal, New York City, N. Y.

Sir: I have been reading the reply made by Arthur F. Bell, in a recent issue of the Municipal Journal to your editorial comment of November 4, in which you criticise the practice of paying contractors for municipal work in municipal paper. Mr. Bell is Secretary-Treasurer of Westmount, Canada, and he seems to have demonstrated to his own satisfaction, upon an alternative bid in which the contractor offered to do certain work for \$95,000 in cash, or \$100,000 in bonds, that the city saved 10 per cent by accepting the bond offer. His conclusions are based on his own hypothesis that if the city had sold the bonds itself, it would have had to sell them at a discount of 15 per cent. There is no answer to this argument, assuming he is correct in his hypothesis and assuming also that this hypothetical price was the best the city could obtain at the time the contract was made. But his conclusions amount to

a pretty severe reflection upon the trading ability of the



GRAVEL FILLING JOINT TO TOP.
Filled Joints in Center of Picture
and at Bottom.



TYPICAL SPLINTERING OF TOP OF GRANITE BLOCK CAUSED BY GROUT IN TOP OF JOINT ONLY.

city officers, since it means that the contractor can obtain city officers, since it means that the contractor can obtain 10 per cent more for the bonds than the city itself can obtain. The officers of our American cities will hardly admit like incompetence; and they can hardly be expected to, with all the facilities afforded for the disposal of bonds by public advertisement and a wide, hungry market.

Of course, it is possible that this contractor made his bid in ignorance of the market price of the bonds, and later learned the market price at his cost.

The principles you advocated are sound, and no one is

The principles you advocated are sound, and no one is The principles you advocated are sound, and no one is so ready to support you in this advocacy as the contractors themselves. Only a few days ago a man of affairs in Chicago remarked to me casually that his father-in-law, a street contractor of some importance, regularly added 20 per cent to his cash price for street improvement jobs in Illinois, where he was required to take bonds in payment. This practice is general, but the rate varies as the character and marketability of bonds and debt certificates vary in the several states. I wonder if Mr. Bell has ever known a business corporation that made a practice of paying its contracts in notes or bonds. ing its contracts in notes or bonds.

Very truly yours,

CHESTER B. MASSLICH.

#### REFUSE DISPOSAL IN SAN FRANCISCO.

In our issue of November 11, under the above heading, we made a brief statement concerning the present status of refuse disposal in the city of San Francisco, and especially its purchase of an incinerator plant. We find that we misinterpreted the information given us by the city engineer, because of the use in that city of the terms "reduction works" and "reduction plant" as meaning

two different things.

As a matter of fact, we are informed that the entire plant, which was purchased by the city but is still operated by a private corporation, consists in reality of two plants, which together are known as the "reduction works," the company having been named the "Sanitary Reduction Works." One of these is a small reduction plant used merely for the disposal of dead animals, which was valued at \$15,000, and this is the one referred to in our article of November 11. Included in and responsible for by far the larger part of the purchase price of \$400,-000, however, was a large incinerator which, as described in table 5A of the November 11 issue, burns nearly 500 tons of material a day. The city, as stated, had contracted for a large distributor plant, but this as constructed was found not to meet the requirements of the specifications and has not been accepted by the city.

#### MACADAM WORK IN CARLISLE.

Carlisle, Pa., maintains and resurfaces its macadam roads by day labor under the charge of its engineer and commissioner of streets, John C. Hiteshew. Records are kept of work of this kind, the data being transferred from the daily reports to job reports so as to give the itemized cost of each job. Each job has its own number and occupies a separate sheet similar to that shown herewith.

STREET DEPARTMENT—COST DATA.

JOD NO. 30.		
Description: Resurfacing Louther str	reet between Hano	ve
and Pitt streets.		
Notes: Approximately 2,600 square	vards.	
Labort	9	
Foreman, 33 hours at 20 cents	31	6.6
Men, 23 hours at 17 cents		2.9
Men, 123 hours at 16 cents	18	9.6
Men. 23 hours at 15 cents		3.4
Carts. 61 hours at 26 cents		
Team, 93 hours at 15 cents		
		0.00
Roller Engineer, 40 hours at 25 cents	10	.01
Materials:	4.40	
Crushed stone, 244 pr. at 61 cents		
Coal, 2 tons at \$4		0.0
Total Costs:		
Labor and Carting	73	.4
Materials		.8
Total		.2

In the work covered by this job sheet, about 2,600 sq. yds. was resurfaced by adding new stone to a depth varying from 6 to 8 inches, which was rolled for 40 hours, or about 15 hours per 1,000 sq. yds. The cost of the crushed stone used, 61c. a perch, or about 66c. per cu. yd., is unusually low, this being due to the fact that the city owns its own quarry and crushing plant. The wages of foreman and laborers also are much lower than in other sections of the country. Even allowing for this, the total cost of less than 9c. per sq. yd. for all

labor and materials is remarkably low.

Another job performed last year consisted of grading and macadamizing 2,000 sq. yds. on Cherry street. The grading ran from about 6 to 10 inches in depth, but most of the excavation was used in filling low spots, which reduced the cost of hauling to a minimum, the total cost for horses and carts being \$18.65. This low cost was due not only to the small amount of hauling, but also to the fact that teams were hired from the fire department at 15c. per hour. The labor consisted of 30 hrs. foreman and 198 hrs. labor. The road was rolled after grading, the roller being employed for 6 hours on the 2,000 sq. yds., at a total cost for engineer and coal of \$2.50. The total cost of grading was \$57.73, or about 2.9c. per sq. yd. Following this grading, 6 inches of macadam was laid on this 2,000 sq. yds. In this work 388 perches of stone were used, costing \$236.68. Carting cost \$41.85 (one team not belonging to the fire department was used 12 hours at 40c.); the labor item was \$34.08, covering 27 hrs. foreman and 189 hrs. labor. The roller was used for 34 hours, or 17 hours per 1,000 sq. yds., the total cost for engineer and coal being \$15.50. This gives a total cost for labor and material of \$314.07, or about 15.7c. per sq. yd. for macadamizing only; or 18.6c. for both macadam and grading.

These cost sheets are intended to give only the actual expenditures for the jobs covered. The true cost would include items of depreciation on steam roller (say 50 cents an hour) and on wagons and tools; an additional charge for the fire department horses, and a proportion of the salary of the street commissioner, office expense

and other general items.

#### STATE ROADS IN MARYLAND.

In highway construction in Maryland, the State Highway Department has made proper distinction between much-traveled and little-used roads, the former being given the preference in construction and maintenance. The state highways are kept in very good condition. It is questionable if any other state can show lower figures on maintenance for all types of roads.

Approximately 150 miles of concrete road have been built in 18 counties, the first being built in 1912. The department states that the local outlay for maintenance on the entire mileage since the construction of the roads began has been approximately \$15,000, or an average of \$100 per mile per year. This amount paid for maintenance included not only the care of the road surface proper, but of shoulders, ditches and embankments as well.

The original or construction cost of these concrete roads has also been reasonable, the average cost being \$14,000 per mile, which, the department states, is only about \$1,500 per mile in excess of the cost of macadam roads. Maintenance costs for concrete roads, as stated above, have averaged about \$100 per mile per year; but macadam maintenance has averaged nearly \$450 per mile per year, including care of shoulders, ditches and embankments, although the greater age of the macadam roads must be considered when comparing these figures.

The statement that concrete roads cost but \$1,500 per mile in excess of concrete represents average figures, and it is therefore interesting to note that in some cases lower bids have been recived on concrete than on macadam, while this year the bids have been running about even.

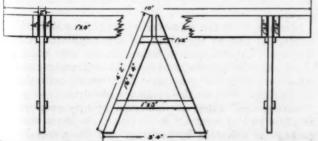
It is interesting to compare the investment costs of the two types of roads, according to the above figures. The \$450 annual maintenance represents interest at 5 per cent on \$9,000, and adding this to the construction cost of somewhat over \$12,000, we have an investment of about \$21,000 per mile for the macadam roads. In the case of the concrete roads, the \$100 annual maintenance represents interest on \$2,000, which added to the construction cost of \$14,000, represents a total investment of \$16,000 per mile for the concrete roads, not taking into consideration the fact that the macadam roads have been in service longer. A description of the construction of a typical concrete road in Wicomico County, Md., is given in Municipal Journal, October 1, 1914. This road, which was 12.14 miles in length, cost slightly less than the costs given above for concrete

# STREET INSPECTION WORK IN SALT LAKE

Some time ago, the inspection of all public improvements in Salk Lake City was put in charge of the engineering department. Radical changes were made and now, with the three new forms in use, one for concrete work, curb and gutter, sidewalks and watermains; one for sewers, and one for asphalt work, it is possible to secure reliable labor costs for all classes of work done. On the back of the report for asphalt work, provision is made for the inspector to show the location and dimensions of each day's work. He is also required to take four samples of the mixture daily, two in the forenoon and two in the afternoon. These samples are turned into the department testing laboratory and careful analyses are made to determine the exact percentage of asphaltic cement and the sand grading. These results are shown on the office records for ready reference in the event that at any time any part of the asphalt wearing surface should develop defects.

#### A CONVENIENT STREET GUARD.

Every street department and those finding it necessary to make excavations in, or to in any way obstruct traffic on, public highways, must of necessity provide some kind of guard for shutting traffic from sections of streets which are still obstructed. The ordinary guard used for this purpose perhaps cannot be improved upon for general service, but the storing of them presents some difficulty, as they usually cannot be piled in compact form. The city of Dayton, Ohio, uses a guard which can be separated into three parts and stored very compactly and several can be carried on top of a wagon load of paving or other material without taking up much space.



STREET GUARD. ELEVATION AND END VIEW OF "HORSE."

The guard consists of a board and two wooden horses for supporting it, the general construction being indicated by the accompanying sketch. Each horse consists of two 1½-inch by 4-inch legs fastened together with 1-inch by 3-inch braces at the bottom and 1-inch by 2-inch braces at the top. The board may be anywhere from 6 to 12 feet long, depending upon the width of the street which is to be blocked off. It is made of a 1-inch board 8 inches wide. About a foot from each end, two 2-inch strips are nailed vertically on each side with a 2-inch groove between them. The tops of the legs of the horse set in between these strips, the board resting upon the top brace of the horse. All braces and cleats are fastened on with screws to secure durability.

#### MORTAR AND CONCRETE

#### Strength as Dependent Upon Sand and Stone as Upon Cement Used—Gradation of Aggregates—Machine Mixing Preferable to Hand Mixing.

In connection with the routine work of the Bureau of Standards, and of the Structural Material Laboratories of the United States Geological Survey which were transferred to the Bureau of Standards in 1910, about 20,000 tests of mortars and concretes have been made. The information contained in these tests has been studied and a paper based upon the conclusions derived therefrom has been published by the Bureau of Standards, having been prepared by R. J. Wigg, G. M. Williams and E. R. Gates. The tests included about 150 different aggregates, consisting of limestones, granites, gravels, trap rock and cinders. Especial attention was paid to the effect of the several variables entering into the proportioning and mixing of mortar and concrete.

"Concrete differs from most structural materials in that it is not manufactured at a mill or plant according to chemical formulas, under the observation of skilled specialists, subject to rigid inspection and test and such control as to produce a uniformly homogeneous product; nor is the process of manufacture completed in a few hours or days, as in the case of steel products. Furthermore, concrete is made from materials obtained from many sources, differing widely in characteristics which affect its quality. The proportions of the ingredients, the amount of water used in mixing, the thoroughness of mixing, the manner of placing, the atmospheric temperature and humidity, exposure to sun, rain and wind, immersion in fresh water or sea water or other natural solutions, all affect the quality of concrete."

Based upon these studies, the authors find the following apparently to hold true:

Sand cannot be said to be superior to limestone screenings as a fine aggregate. Apparently the strongest mortars are obtained by a uniform gradation of particles; but some materials seem to offer exception to this rule, and any limitation arbitrarily placed upon the proportioning of particles of various sizes will probably eliminate some very satisfactory materials.

Mortars made from sands with round grains are equally as strong as from those with sharp grains. Silt or material removed by washing or screening through a 200-mesh sieve may be advantageous even in relatively large quantities, or, on the other hand, it may be detrimental in small quantities, depending upon its form and distribution

In fact, the authors find the final aggregate tests to be so conflicting on these points that they have come to the conclusion that "the only satisfactory method of determining the value of a fine aggregate in mortar mixtures is to test it in the mixture in the same proportion to be used, exposed to the same conditions as in the proposed structure. Common usage has demonstrated that certain sands are satisfactory and therefore no tests of these materials are necessary except to identify them." They also conclude that because a fine aggregate makes a strong mortar it does not necessarily follow that it will make a strong concrete, but the only reliable test is one of the actual concrete made with the fine aggregate in question.

Some limestones are superior as coarse aggregates to some gravels, and, on the other hand, some gravels are better than some limestones; and, in general, no one type of aggregate can be said to be always superior to another, since the range of qualities in any one type is very great.

Greater uniformity is obtainable by machine mixing than by hand mixing, unless the latter be carried to an extent which would be uneconomical. Concrete manufactured from the same materials in the same proportions by two sets of experienced workmen may vary in compressive strength by 70 per cent or more.

The most satisfactory consistency for concrete from the standpoint of strength and durability is a quaking mixture, and the errors should be on the side of using too little rather than too much water, providing it is properly spaded or worked into place in the forms. Using the same aggregates and proportion of cement to total volume of combined aggregate, the concrete having the greatest density will usually have the highest compressive strength; but this does not hold true of mixtures in which the ratio of cement to the total volume of aggregate is not the same. Also, density is no criterion of the relative compressive strengths of two mixtures of the same proportion of cement to total aggregate, if different aggregates are used.

The character of the exposure of the concrete after moulding materially affects its compressive strength. If the original water is permitted to evaporate from the concrete and all water is subsequently excluded, the compressive strength may be reduced 40 per cent or more. Concrete should be kept wet for several days or weeks if it is to attain maximum strength. Steam greatly accelerates the hardening process and will increase, by several hundred per cent, the strength of a concrete only a few days old.

There is no definite relation between the gradation of the aggregate and the compressive strength which is applicable to any considerable number of different aggregates; and no equation for a gradation curve can be prepared which will apply to a number of different aggregates, so far as can be learned from the tests studied.

Excessive fineness does not necessarily render a sand totally unsatisfactory for concrete. A seashore sand having 99 per cent passing a 50-mesh sieve, when mixed with a good aggregate and cement, was found to give a satisfactory concrete.

It follows from the above that no standard of compressive strength can be assumed or guaranteed for any concrete, based upon either the proportions or the aggregates used, but the strength will depend upon all the factors entering into its fabrication. The compressive strength is just as dependent upon careful workmanship and the use of the proper quantity of water as upon the amount and quality of cement used. "Too much emphasis cannot be placed upon the injurious effect of the use of excessive quantities of water in mixing concrete."

A fine aggregate may make a good concrete when mixed with one coarse aggregate and a poor concrete when mixed with another; and, similarly, a coarse aggregate may make good or poor concrete depending upon the fine aggregate used with it. By proper proportioning and attention to methods of fabrication, aggregates available at the site of the work which appear to be inferior may give as high compressive strength in concrete as the best selected materials brought from a distance, if the latter are carelessly or improperly used.

Density is a good measure of the relative compressive strength of several different mixtures of the same aggregates and with the same proportion of cement to total aggregate. The mixture having the highest density need not necessarily have the maximum strength, but it will have a relatively high strength. However, two concretes having the same density but composed of different aggregates may have widely different strengths, and the gradation curve for maximum compressive strength differs for each aggregate.

With the relative volume of fine and coarse aggregates fixed, the compressive strength of a concrete increases directly as the cement content, although not in the same proportion. Increase in the ratio of cement to the total aggregates, however, does not necessarily increase the strength if the relative proportions of the aggregates vary.

Since the compressive strength of concrete varies with the characteristics of the material used, with the proportions of cement, fine and coarse aggregate, and with the methods of fabrication and exposure, it can be determined only by testing concrete actually prepared and treated in the manner prescribed.

#### FREQUENCY OF REFUSE COLLECTION.

In one of the tables published in our November 11th issue was given the frequency of collecting garbage and ashes in summer and in winter for each of a number of cities. A synopsis of these figures gives the following results:

Garbage is collected in summer once a week by 23 cities, twice a week by 61 cities, three times a week by 43 cities, four times a week by two cities, and six times a week by 25 cities. In winter one collection a week is made in 50 cities, two collections in 50 cities, three collections in 18 cities and six collections in 19 cities.

Ash collections are made as follows: In summer, one collection a week in 35 cities, two collections in 23 cities, three collections in 14 cities, and six collections in 9 cities. In winter, one collection is made in 37 cities, two collections in 29 cities, three collections in 13 cities, four collections in 1 city and six collections in 9 cities.

Other schedules of collection reported are as follows: One city collects garbage and ashes in the business districts twice each day both winter and summer. Another city collects garbage three times in two weeks during the summer. Two cities collect garbage only once in two weeks during the winter. Five collect ashes once in two weeks in the summer, one once in six weeks, and one once a month. Three collect ashes once in two weeks in winter. Collections in one city vary from one to six times a week.

In some cases the numbers of collections differ in the residential and in the more thickly populated parts of the city. Considerable information on this point may be obtained by reference to the table. Twenty-one cities altogether reported that they make more collections in the business than in the residence districts.

Garbage and ashes are collected by city employees in 98 cities and by contract in 78 cities. In three cities the garbage is collected by contract and the ashes by city employees.

# Municipal Journal

Published Weekly at
50 Union Square (Fourth Ave. and 17th St.), New York
By Municipal Journal and Engineer, Inc.
Telephone, 2805 Stuyvesant, New York
Western Office, Monadnock Block, Chicago

S. W. HUME, President
J. T. MORRIS, Treas. and Mgr. A. PRESCOTT FOLWELL, Secretary
A. PRESCOTT FOLWELL, Editor

Subscription Rates

CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for. Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

#### DECEMBER 9, 1915.

# Page Pavement Maintenance in Montclair. (Illustrated.) Sand Tests for Road Work. Supervision of Highway Work. Supervision of Highway Work. Tractors and Trailers in Municipal Work. (Illustrated.) Joint Fillers for Granite Block. (Illustrated.) Stractors and Trailers in Municipal Work. (Illustrated.) Paying Contractors in Municipal Paper Refuse Disposal in San Francisco. Macadam Work in Carlisle. State Roads in Maryland. Street Inspection in Salt Lake City. A Convenient Street Guard. (Illustrated.) Street Inspection in Salt Lake City. Salt Mortar and Concrete. Salt Mortar and Concrete. Salt Frequency of Refuse Collection. Salt Red Tape vs. Responsibility and Publicity. Salt Red Tape vs. Responsibility and Publicity. Street Trees in Pasadena. Salt Traffic Signals. (Illustrated.). Salt Cost of Road Roller Operation. Salt The Week's News. (Illustrated.). Salt The Week's News. (Illustrated.). Salt The Municipal Index. Salt Personals News of the Societies. Salt Personals New Appliances. (Illustrated.) Salt Mortar News Salt Mortar News

#### Roadway Maintenance.

To the average engineer or superintendent of any public work there is more pleasure in new construction than in the maintenance of old work, especially where, even with the best endeavors, the results obtainable are not perfectly satisfactory. And yet, to the city engineer or highway department in any of the older cities, or to a state or county highway department where a large percentage of the roads have been completed for a number of years, the problem of maintenance and repairs is much more important and pressing than that of new construction.

Those having only a limited experience in road maintenance work who are placed in charge of highways in small cities and towns, looking for advice on the best modern methods, will find plenty of information concerning how to construct bituminous macadam or bituminous concrete roads; but they are confronted with the problem of doing the best they can with roads already constructed of water-bound macadam, in order to obtain as much wear out of them as possible before they reach the point where complete resurfacing is necessary or justifiable, and information concerning this kind of work is not so abundant.

Such a problem and the methods of solving it are described in an article in this issue. Neither the prob-

lem nor the methods contain anything startling or unusual; but for this very reason they will perhaps be of interest and we hope of service to a number of highway officials. Here we have a town in which 80 per cent of the entire mileage, or 60 miles, is already paved with water-bound macadam, and 10 per cent more with other kinds of surfacing. Automobile traffic was rapidly reducing the macadam to a condition which was giving rise to general complaint and which it was demanded that the city engineer should remedy. The town was even willing theoretically to take up water-bound macadam which still had several years of life in it and replace it with bituminous macadam or other pavement more durable under automobile traffic; but it was found that an annual appropriation of \$30,000 was barely sufficient to keep the streets in a passable condition and that if any considerable amount was taken from this for resurfacing, a large percentage of the streets would rapidly reach a condition which could not be tolerated. How the town engineer has managed to keep these old water-bound macadam roads in a good condition under the heavy automobile traffic is told in the article referred to.

#### Red Tape vs. Responsibility and Publicity.

"The most efficacious way of securing responsibility is by complete publicity, which is in itself cheap, simple and entirely effective, and not by a complicated system of interlocking powers, with checks and balances, which is costly and complex and has never proven to be efficient." This is the statement with which Otho G. Cartwright, director of the Westchester County Research Bureau, concluded a paper before the American Academy of Political and Social Science.

The power of public opinion was never so great as it is today. The heads of railroad systems, who a generation ago said, "The public be damned," now send frequent bulletins to the newspapers of the land to influence the opinions of that same public. And from them to the "white wings" who clean the streets and even the self-seeking politician, all have a wholesome respect for public opinion.

This is most promising for improvement in public affairs; and such improvement will be made only as the fact is recognized and acted upon. It has been proved that checks and duplicated responsibility do not protect the public against dishonesty. And red tape binds the hands of an earnest official, stifles initiative and costs more than it saves. A street superintendent once told us that the red tape involved in having repairs made upon one of his machines, which could be done in a day at a cost of \$25, required at least a month, during which time the machine was withdrawn from service and the department worked at a disadvantage which caused a loss of at least \$300 to the city. And such instances could be multiplied by the thousands. Every department head, superintendent, city engineer and other responsible official should have some freedom of action and an ample emergency fund to draw upon as his judgment dictates; the expenditures from which he should account for fully at stated intervals. Red tape should give way to individual responsibility. If the judgment of the official is found to be unreliable, then he should be replaced by one who can be trusted with such responsibility. A city will never get high-grade men to serve it so long as it ties their hands with red tape and thus prevents them from making a record for themselves by giving the good service which they could and would gladly give. Ambition to serve the public efficiently dies quickly under such conditions.

But with this larger freedom, publicity must be se-

cured as a check on dishonesty, inefficiency or extravagance, and also to secure for the officials that recognition of efficiency and economy which serves as a stimulus to further efforts. Officials themselves can help to this end (which we believe all earnest and ambitious ones would welcome) by voluntarily giving publicity to their official acts in such a way as to really inform the average taxpayers and win their approval. Having convinced them of the reliability of such judgment as he is allowed to exercise, he is then in position to ask for an extension of the limits within which he may exercise it.

The average citizen means to be fair. It should be possible for an official to convince him of his ability and honesty (if they exist) by frank and informative publicity.

#### TRAFFIC SIGNALS.

Quite a number of cities throughout the country have, during the past year or two, adopted a simple traffic signal consisting of arms or discs supported on the end of a rod at a height of about eight feet above the street surface, this disc being revolved, or the arm raised or lowered like a semaphore, for controlling the progress of traffic on the intersecting streets. Such a signal possesses the advantage of being more readily seen by both pedestrians and drivers than is the hand of the traffic policeman, since it is about three feet higher above the pavement; it also relieves the policeman of the tiring necessity of holding the arm horizontal through a large part of the day.

As far as we have observed, the use of the disc is at present taking the place of the semaphore. There are two advantages in the disc: one, that the apparatus is more simple and less likely to get out of order, and the other, that the disc occupies less space than the semaphore and so interferes less with passing traffic. In some cases one disc only is used with the word "stop" painted on it. In other cases there are two discs at right angles, one carrying the word "stop," either disc or lettering being in red; the other the word "go," green being used on this disc in most cases. The device consists of a heavy cast base into which is screwed a wrought iron pipe and in this revolves the rod or pipe which carries the disc or discs; a handle being attached to the rod by which to revolve it, and stops being provided on the outer pipe so that the disc will be held at a position perpendicular to one street or the other. The entire signa!

is removed from the street by the policeman when he leaves his post.

A variation of this design has been adopted in Fort Wayne, Ind., at the suggestion of Mayor William J. Hosey, and is used in streets where the car tracks are so close together as to allow only six inches clearance between cars. A semaphore signal could not be used here: a double-disc signal even would be impractical unless the discs were less than six inches in diameter; the suggested lengthening of the rod so as to bring the discs above the tops of the cars was impractical, it was decided, because the disc was too



FT. WAYNE SIGNAL.

high to be seen from automobiles when their tops were up. The signal adopted has one circular disc painted red and carrying the word "stop" painted in white. While the cars pass, this disc will be facing parallel to the tracks and thus will not be hit by the cars. (We assume that the policeman has stepped out of the car tracks while the cars are passing.) Even so, the disc might be struck by the cars if not held firmly in exact position, and the base in this case is set into the pavement so as to effect this. When it is desired to stop traffic in all directions to clear the way for fire, police and ambulance conveyances, the disc is turned quartering so as to be seen in all four directions.

#### COST OF ROAD ROLLER OPERATION.

The engineer in charge of highway work in an eastern town has given us the following figures concerning the cost of operating 12-ton road rollers. Such a roller will cost about \$3,000. After five years of fairly continuous service under ordinary conditions it will probably be desirable to obtain a new roller, turning in the old one to the manufacturers in part payment, since by this time the boiler, engine, gears, and pretty much every part of the roller will have become so worn that it will be uneconomical to operate it. Meantime it will have cost about \$150 a year for repairs, but this will probably be approximately offset by the amount allowed for the old roller in exchange. We therefore have a depreciation of 20 per cent, or \$600 a year. If we assume that the roller operates onehalf of the working days of the year (which is approximately the general average for this section of the country, allowing for stormy days and for seasons when no work is under way), we have a depreciation charge of \$100 a month, or about \$4 a day. The roller will consume about 500 pounds of coal a day, or a quarter of a ton ,which must be delivered on the street in small quantities and which may therefore cost \$8 per ton at the roller, or \$2 per day, which is probably sufficient to cover oil and grease and any other minor expenses. If the roller man be paid \$3 a day we have a total cost of \$9 per day under the above assumptions.

In climates or under conditions where the roller can be used a greater percentage of the time, and where coal and engineer's wages are lower, the cost may fall as low as \$6, while, on the other hand, it may rise to \$10 or even \$12 where wages are high, and especially where the roller is used considerably less than 50 per cent of the time. It is probable, however, that the life of a roller would be longer with less frequent use, provided that care be taken to properly house it and keep it in condition.

#### STREET TREES IN PASADENA.

One of the features of Pasadena, Cal., is its shade trees and the manner in which they are improved by proper attention. When Pasadena was a small city, trees were planted by the property owners, each planting the kind that seemed best to him; but in 1907 the city assumed control of the planting of street trees and also the parking on all the streets in the city.

At first trees were purchased by the city, the price ranging from 75 cents to \$1.25 per tree, but later they were raised by the park department at a considerable saving; the price for trees in the city having dropped to 15 or 20 cents. After the trees are two or three years old they become infected with scale and require spraying. By the purchase of a spraying outfit the city has cut the cost of this treatment in half and the city and county authorities co-operate in the extermination of bugs and scale. The average cost of caring for the trees is 20 cents per year per tree.

The State Highways of New Jersey-Epidemics in Three Towns-New Jersey Diversion Suits-Knoxville's Water Board Illegal-A Novel Lighting Contract-"Preparedness" of New York's Police-Inspectors Blamed After Fire -Chicago's Tight Finances-Big Bond Issue for Pittsburgh-Nashville, Continued-Commission Form Law Legal-Railway Bankrupt After Jitney War-Workmen's Compensation in Pennsylvania-Municipal Research in Dallas-New Jersey's Engineering Conference.

#### ROADS AND PAVEMENTS

Dixie Highway Opening Date.

Knoxville, Tenn.-Thanksgiving Day, 1916, has been finally fixed as the time for the formal opening of the eastern route of the Dixie highway, according to a statement made by Judge M. M. Allison, president of the National Dixie Highway Association, before a meeting of the delegates from the eastern Dixie route at Knoxville. It was also announced at this meeting that the route through Cincinnati and Dayton would be first completed as that will probably be most traveled. The road is practically completed now from Cincinnati to Knoxville, excepting through the mountainous counties, and there the work is progressing satisfactorily.

New Jersey Roads Need \$51,300,000. Trenton, N. J.—Inadequacy of the present road system in New Jersey and the increasing necessity for the adoption of a policy to meet the demands of traffic, are the main points in the annual report of State Road Commissioner Edwin A. Stevens. The magnitude of the problem is indicated by an estimate of Colonel Stevens that \$51,-300,000 would be required to place the highways of the state in proper condition. Colonel Stevens believes that the new road policy must state definitely the problem in figures and must create a proper road force. The first would require a survey of the roads of the state and a thorough and uniform system of accounting to show, not only the moneys expended, but also the services rendered therefor. To build up a proper road force, Colonel Stevens believes permanent tenure of office is necessary. The report emphasizes the continual and phenomenal increase in motor vehicle traffic. In 1912 there was one automobile to every 50 of population; in 1913, one for every 46; in 1914, one for every 40, and in 1915, one for every 32.4. Otherwise stated, there are about six automobiles for every mile of country road, excluding streets. Colonel Stevens shows that the increase in receipts from motor vehicles has not been at all proportionate to the increase in demand for assistance from the different counties. Five years ago, from one-third to one-half of the amount needed to keep the main lines of traffic in repair could be met out of the motor vehicle fund. This year, despite an unexpectedly

large increase in receipts, it has been impossible to provide more than about twenty per cent. of the money that should have been spent for repairs. Colonel Stevens calculates that it could be proved, as a fair average, that an automobile making 6,000 miles a year, inflicts a damage of from \$30 to \$35 on the roads, and pays a license fee of \$7.50. For an ordinary two-horse team, it is estimated that the damage done will cost not more than \$8 to replace.

There are no definite figures as to mileage and cost of maintenance. All that is known with certainty is that 1,988 miles have been improved with state aid. The total road mileage, exclusive of streets, probably is about 15,000. Showing that repair work today consumes twice as much of the state funds as does the construction of roads, Colonel Stevens calls attention to several faults in the legislation controlling road building and maintenance. He says it is evident that as both mileage and traffic show further increases, the cost of repairs and the ratio of the cost to the total road expense must continue to increase. Stevens urges that all work be arranged for in the early months of the year, so that it can be begun toward the end of March or the beginning of April. There is, however, at that time of the year but little money available in the motor vehicle fund, and allotments cannot be made to provide for more than a fraction of the work until toward the end of spring. This results in the most important work not being begun until the season of the heaviest traffic, to the great inconvenience of the public and at considerable increase in expense.

Grading for Boulevard.

St. Paul, Minn.—It is expected that grading for the Mounds Boulevard here will be completed this month, according to L. A. Bumgardner, in charge. The cost will be about \$11,000. A steam shovel and a train of dump cars are at work on the excavation and removal, as shown in the accompanying illustration.

#### City Not Responsible for State Bridge Defects.

Cranston, R. I.—The case against William M. Lee, city treasurer of Cranston, for damages alleged to have been sustained by reason of a defect in the bridge over the Pawtuxet River, has been decided in favor of the city by the Supreme Court. The Superior Court gave a verdict for the plaintiff, but City Solicitor Frank H. Wildes took



Courtesy St. Paul (Minn.) Pioneer Press. GRADING THE MOUNDS BOULEVARD, ST. PAUL

exceptions, claiming that at the time of the accident the bridge was under the control and supervision of the State Board of Public Roads, and that, being thus subject to the administration of the state, the city of Cranston was absolved from any responsibility for its defective condition. The city of Cranston by the laws had become divested of any power to repair or to do anything in or about the maintenance of this bridge.

#### SEWERAGE AND SANITATION

#### Measles Epidemic in Paterson.

Paterson, N. J.—Dr. Thomas A. Clay, health officer, is fighting a measles epidemic which is said to be the worst ever experienced by Paterson. How long it will continue cannot be estimated, but every effort is being put forth by Dr. Clay through the agency of the Health Department to curb the epidemic. First intimations that the cases of measles were more than normal in number came about three weeks ago, but that number did not become threateningly large until a week later. There are hundreds of cases throughout the city. Conditions prevailing here are similar to those in surrounding towns, where in some cases, as in Prospect Park borough, it has been necessary to close down the public schools.

#### Diphtheria in Michigan Township.

Sault Ste. Marie, Mich.—Raber township is threatened with a general epidemic of diphtheria. Seven new cases have been reported in one day. An automobile carrying a large quantity of antitoxin was rushed to that place upon order of Poor Commissioner A. W. Taylor. Supervisor Goetz has a case in his own family. It is said that about a dozen places are quarantined now and all of the schools are closed.

#### Vaccination of Whole Town Population.

Jessup, Pa.—It is reported that the entire population of the town of Jessup, 5,200, must submit to vaccination, following the discovery of two new cases of smallpox, making three reported to the Board of Health. Pursuant to the general order issued by Dr. Caville, head of the town's Board of Health, a squad of eight physicians started out to innoculate every man, woman and child. The general vaccination order was issued when it came to the attention of Dr. Caville that his previous order that all public places remain closed until the disease was stamped out had been violated.

#### Sue to Stop Industrial Fumes.

New York, N. Y .- Dr. Hermann M. Biggs, State Commissioner of Health, who was directed by Governor Whit-man to make an inquiry as to the smoke and fumes from New Jersey, which annoy residents of Riverside Drive, in a report finds that "the conditions arising from the emission of smoke, gases, fumes, and vapors constitute a public nuisance, which affects the comfort and repose and also indirectly, if not directly, the security of life and health of a considerable number of persons in New York." Governor Whitman has transmitted Dr. Biggs' report to Attorney-General Woodbury, accompanied by a letter in which he said that as the executive authority vested in him under the public health law for the abatement of nuisances does not extend to those which have their origin in another state, I submit the matter to the attorney general in order that such legal proceedings may be taken as may be found advisable. Attorney General Woodbury announced that he would immediately commence an action in the United States Supreme Court on behalf of the state to restrain the offending factories on the New Jersey shore from contaminating the atmosphere of the upper side of Manhattan.

#### State Health Records Secret.

Harrisburg, Pa.—The refusal of Dr. Samuel G. Dixon, commissioner of health of the state of Pennsylvania, to produce the records of his department for use by the defendants in the case of a woman against an insurance company, has been upheld by Judge Johnson in the Common Pleas Court at Media. Dr. Dixon, who appeared in response to a subpena duces tecum was accompanied by Assistant Deputy Koona, of the attorney general's office. The

latter argued that Dr. Dixon has discretionary power as to whether the production of such records are conducive to the public welfare, and that, being charged with the protection of the health of the people of the commonwealth, and believing that the public use of the medical records of the department in private litigation would seriously hinder and interfere with the department's work, he had decided that such records should not be produced. Dr. Dixon stated after the hearing that it was the first time the question had been raised in the last decade. The decision, he said, protects the rights of the 70,000 persons in this state that have already been treated at the tuberculosis dispensaries and that people going to dispensaries for treatment must always feel that their rights are protected, otherwise many would hesitate to submit themselves for treatment.

#### WATER SUPPLY

#### City Wins in Diversion Suits.

Trenton, N. J.-In setting aside verdicts obtained by the Auger & Simon Silk Dyeing Company against the city of Newark and the East Jersey Water Company and the Jersey City Water Supply Company, for diverting water from the Passaic River, the Court of Errors and Appeals established a new precedent. It is that where the purpose of a riparian owner is to divert water and return it to the stream in a polluted condition he is entitled to only nominal damages for being prevented from committing such a public nuisance. The decision also resulted in setting aside a similar verdict for damages obtained by the Weidmann Silk Dyeing Company against the East Jersey Water Company, the Montclair Water Company and the cities of Newark and Jersey City. The judgments in the latter case were as follows: Against the city of Newark, \$5,602,96; against Jersey City, \$15,425.52, and against the water companies, \$8,780.87. The Auger & Simon Co. obtained a judgment against the East Jersey Water Company for \$3,636.24, and against the Jersey City Water Supply Company for \$7,031.77. In setting aside these and the other judgments the court has laid down a rule which may go far to solve the difficulties of municipalities and water companies which have been involved in litigation for damages resulting from diversion. There are four suits brought by other dyeing companies against Newark pending in the Passaic Circuit, where the circumstances. upon which an ultimate decision will be reached are the same.

#### Village to Sue Water Company.

Girard, O.—Village council has unanimously passed a resolution directing the mayor to bring action in some court of competent jurisdiction to compel the Girard Water company to comply with the terms of its franchise. The resolution was passed subsequent to a report submitted by a special committee which has been investigating water conditions here for the past eight months. The report stated that the company did not give an adequate supply of water and that as a result many residents of the village were without water service and fire protection. Superintendent Jerome Gray, of the Girard Water Company, admitted that the wells now operated by the company would not supply the demand for a town of this size. It is not likely that any steps will be taken toward another supply of water until the mayor proceeds against the company as directed by council.

#### Water Works Board Illegal.

Knoxville, Tenn.—The act creating the Water Works Commission and authorizing the issuance of bonds not exceeding \$500,000 for improvements to the city water plant is unconstitutional, in the opinion of Chancellor Will D. Wright. The court so held in passing upon the merits of litigation instituted by S. G. Heiskell, seeking to enjoin the city, as well as the City Commissioners and the Water Works Commissioners, from recognizing the validity of a recent act. The decision prevents the city from using the proposed bond issue either toward the construction of another water plant or in any way expending the money. The complainant, S. G. Heiskell, contended that the law was

unconstitutional because it violated article 3, section 17, of the Acts of 1870, since the water works act did not recite in the caption, or the title, or the body of the bill the title or caption of the charter of the city of Knoxville, and also because the water works act did not state the substance of the charter of the city of Knoxville, which charter chapter 698 of the Acts of 1915 purports to amend. The complainant's bill also attacked the policy of the legislature in passing the water works act and in conferring on the Water Works Commissioners such broad powers in using and expending \$500,000 for installing a new plant without requiring the Water Works Commissioners to execute bond. The city filed a demurrer to this bill on October 9, but the court overruled the demurrer except as to one or two grounds relating to the policy of the bill, which the court sustained on the ground that it was a matter for the legislature to decide, so far as the powers and restrictions to be placed on the Water Works Commissioners were concerned. However, the court held that the law was unconstitutional because it did not recite the title of the charter, or of chapter 698 of the Acts of 1915, either in the title or the body of the water commission act. City Attorney J. Pike Powers, Jr., says the city will appeal from the decision of Chancellor

City Fights Higher Rate.

Richmond, Ind.—City Attorney Bond and President Bavis, of the board of public works, are preparing for the hearing of the case before the state commission in which the Richmond City Waterworks Company asks for an increase in local water rates, a petition the city intends vigorously to oppose. Data on water main extensions has been compiled by City Clerk Bescher for the purpose, it is understood, of defeating any effort on the part of the company to attempt to collect from the city revenue on certain main extensions which, the company contends, the city is obligated to pay. Under the regulations provided for the waterworks company by the commission the company is entitled to a revenue of ten cents a foot per year. for every main extension ordered by the board of public works, and each extension must be at least 500 feet in length. Extensions of such length call for a fire hydrant, the annual rental for which, \$55, provides the company its required extension revenue. On some extensions the company has not been receiving its required revenue and the city has refused to pay the company revenue for the same because, it alleges, they were not ordered by the The commission, it is also anticipated, will be called upon for a ruling as to whether the city must pay annual rental for each of the twenty-nine intermediate fire hydrants. For a year the company has billed the city for these hydrants and the claim now amounts to \$1,295. The city has refused to pay, asserting that the commission verbally announced that the city was not expected to pay for such hydrants. The company bases its rental charges for such hydrants on the order of the commission entered last year establishing local water rates, which sets forth that the city shall pay for "all" fire hydrants.

#### STREET LIGHTING AND POWER

#### A New Kind of Lighting Contract.

Racine, Wis .- The first "indeterminate" street lighting contract ever offered a city in the country has been submitted to a committee of the Racine common council by S. B. Way, vice-president and general manager of the M. E. R. & L. Co. The terms permit the electric company to make expenses and 6 per cent interest on the money invested, prevents it from making any profit beyond that, and guarantees it against loss. The price of lights is determined by the actual cost of operating the service. The price of service will be adjusted every year. If the city has ordered extensive extensions and costly underground work, the average charge per lamp will be increased to meet the expense in excess of the average cost under 1 resent conditions. If no material changes are made in the equipment, the tendency will be to reduce the cost through more efficient operation. If lamps are ordered installed at points where the expense is not heavy, it will reduce the average cost.

To begin with, the company estimated its special investment devoted to street lighting to be worth \$62,294.60, and there has been set aside a replacement reserve of \$10,084.44. On this basis Racine will get street lights the first year more cheaply, it is claimed, than any city of its size in the country. The proposed and the present prices follow:

	New	Old
Arc lights, overhead circuit	\$53.52	\$72
Arc lights, underground circuit	78.70	90
Mazda lamps, overhead circuit	20.16	21
Mazda lamps, underground circuit	28.06	21

In case underground conduits are laid, the street lighting department of the company is charged up with only a proportionate share of the cost, according to the proportionate amount of the conduit space used for exclusively street lighting purposes. The city guarantees the company that it will receive each year 5 per cent of its investment in special equipment for replacement reserve; one-half per cent for insurance; one and a half per cent for taxes; 6 per cent for interest; direct operating expenses and its share of joint operating expenses. The city guarantees a return only upon a proportionate share of the cost of equipment installed for joint use of the street lighting service, commercial lighting department or street railway department. The city can terminate the contract at will by paying to the company the difference between the accumulated replacement reserve plus the scrap value of special equipment, and the actual cost of that equipment. cost of fixed charges and operating expenses on investment for public lighting and commercial service is subject to review by the state railroad commission. The costs of new special equipment and operating expenses for street lighting alone are to be reported to the city each year, the books always being open to city officials. vision is made in the contract for payment to the city in case lamps contracted for are not lighted during the hours required.

City Sells Lighting Plant.

McKinney, Tex.—In an election the proposition to sell the local municipal lighting plant to the Texas Light & Power Company carried by a majority of 94 votes. The company is under contract with the city to improve the property to the extent of \$100,000 after the plant comes into its possession and also to furnish McKinney with natural gas within one year.

#### Paying for the Passaic Gas Fight.

Passaic, N. J.—Mayor Seger has asked the aid of Newark, Trenton and Jersey City in paying their proportionate share of the cost of the recent reopening of the 90-cent gas case in the Court of Errors and Appeals. The court afterward reversed its original decision against this city. George L. Record, as special counsel, has sent a bill to the city for \$1,200. The resolution asks that Jersey City and Newark pay \$400 each and this city and Trenton \$200 each.

#### Cities Protest Favorable Valuations.

Ashtabula, O.—A petition protesting against the tentative valuation placed by the Public Utilities Commission on the properties of the Ashtabula Gas Company has been filed at Columbus by the cities of Ashtabula and Connaut and the village of Geneva. The filing marks another important development in the fight of Ashtabula, Conneaut and Geneva against higher gas rates. C. L. Shaylor, city solicitor of Ashtabula, stated that, while the valuation as determined by the Public Utilities Commission is far more favorable to the cities than to the gas companies, there are certain items in that valuation which the cities think should not be included. The valuation has been protested by the gas company.

#### City Takes Over Electric System.

Ashland, Ore.—This city will take over the equipment for distributing current for lighting and power of the California-Oregon Power Company within municipal limits, purchasing energy at wholesale rates. A contract has been signed for three years, which probably will go into effect January 1, 1916. In the meantime the outside corporation

will vacate the local field, leaving the municipal system in full control. Heretofore the patronage has been divided. The city pays a flat wholesale rate for current. This change will be made without resorting to a special election, a like proposition having been defeated at the polls some time ago. In this instance, however, the city assumes no further bonded indebtedness.

#### FIRE AND POLICE

Fire in City Hall.
Rome, N. Y.—Fire at noon in the top floor of the City Hall, believed to have been due to spontaneous combustion in a record cabinet, for a time threatened to destroy the whole building before it was extinguished. Mayor Midlam and other city officials rushed through the smoke-filled building and carried valuable records and equipment to Many of the offices were flooded and damaged. The supports to the bell tower are half burned away and it was feared for a time that the big bell would fall into the building. Several firemen were overcome by smoke. The fire took half an hour to extinguish.

#### Training Police for War.

New York, N. Y.-How members of the Police Department are being trained in preparedness is told by Commissioner Woods in a new report of the department. The committee is engaged in developing a plan to enable the police to cope with any great emergency which might arise in this city, and to aid the police on such occasions they have collected information and data concerning power houses, reservoirs, hospitals, and large buildings for shelter, railroad, steamship and automobile facilities, munition stores, and aeroplane owners. Skeleton orders have been prepared to provide for the detail of any number of the force to any given point in case of an emergency. A plan of auxiliary signals and communication has been made, and members of the force are practicing in the transmission of messages. Officers who are assigned to study and instruction at the United States Army camp at Plattsburg have made careful notes, particular attention being paid to commissary and quartermaster details. Plans for field bakeries are also being worked out, and professional and business men who may aid the department with their special knowledge, covering a wide field of activity, have been listed for

#### Officials Assailed After Brooklyn Fire.

New York, N. Y .- The jury which sat in Coroner Wagner's inquest into the Diamond candy factory fire in Brooklyn, in which twelve lives were lost, declared that the State

Industrial Commission, of which John Mitchell is chairman, is "inefficient, neglectful and wasteful." It is expected that the finding of the jury will be laid before Governor Whitman and other state officials. .The jurors held the owner of the building, her husband, and the two proprietors of the Essex Shirt Waist Company, which occupied part of the factory, criminally responsible for the loss of life. The jury found the commission guilty of neglect because of failure to enact proper rules or regulations to safeguard the people who are employed in factories of five stories in height. Jeremiah J. Flood, the chief inspector, was found "ignorant of his duties and inefficient." It was charged that violations have not been properly and promptly prosecuted, especially those with reference to fire exits and fireproofing of stairways. At the end of the fiscal year—1915—in the First District 10,650 factories were not inspected out of a total of 35,900; also out of 3,711 viothe same period, relating to fireproofing of stairways in factories, only 246 were complied with, and out of 4,589 violations issued with reference to additional means of exit only 246 were complied with, The jury declared that payments of about \$24,000 a year by the state for meals and hotel charges to the members of the Industrial Commission while in New York City, and for meals for the inspectors, supervising inspectors and assistant chief inspectors in New York City was unwarranted and should be prohibited. The jury also condemned the use by members of the commission of state automobiles for purposes other than official business.

#### San Francisco Auditorium Fire.

San Francisco, Cal.—One fireman was burned to death and four others were injured in a fire which destroyed the old auditorium at Page and Fillmore streets, and did \$30,-000 damages to adjoining buildings. The total damage is estimated at \$60,000. The man who lost his life was Dennis Mulcahy, hoseman of engine 21. The injured were Edward Materne, truckman; John Gilbert, truckman; Eugene Reardon, hoseman, and John Lacka, truckman. An interesting incident of the fire was the heroism of a terrier which entered a burning stable back of the auditorium three times to rescue two pups and two kittens.

#### MOTOR VEHICLES

#### New Truck in Service.

Laurens, S. C .- City Council has just received and turned over to the local fire company an \$8,000 auto fire The truck has a 74 horse-power engine and can run sixty miles an hour.

#### Pumping Engine Tested.

Muncie, Ind.—The new fire apparatus has received its first tests and been found satisfactory. A 75-foot stream was thrown through a two-inch nozzle at a pressure of 120 pounds at the pump. The engine pumped at the rate of 840 gallons per minute. In a high-pressure test a 200pound pressure was developed at the pump, 75 pounds at the nozzle, and the stream thrown had an effective reach of 95 feet. Four hundred gallons of water per minute were thrown.

#### New Chemical in Service.

Rensselaer, N. Y.-The illustration shows one of the five new fire fighting machines. The autos were made by W. L. Schupp & Son of Albany, and are mounted on Federal chasses. A Mack auto is also to be placed in the department's service.



lations issued in the First District for Courtesy, J. W. Wickens, Rensselaer, N. Y., and Albany (N. Y.) Journal. RENSSELAER'S NEW FIRE AUTO.

#### GOVERNMENT AND FINANCE

Chicago Must Cut Expenses.

Chicago, Ill.—Expenses for all departments of the city government will have to be cut 14 per cent. after the first of the year. Indications also are that the municipal pier and the contagious disease hospital cannot be opened as planned. Last year the appropriation of the city government was \$28,000,000. This year that amount will have to be reduced fully \$3,000,000, unless some means is devised for overcoming the financial embarrassment of the city. The contagious disease hospital is almost completed, and it was planned to receive patients the first of the year. However, without funds to maintain the institution, it cannot be opened.

Increase in City Debt.

Providence, R. I.—Providence's net city debt increased \$570,451 in the fiscal year ending September 30, according to the report of City Auditor Chase. The standing of the debt October 1 was \$14,093,528.71. During the year the gross debt increased \$1,015,000, while an advance of \$445,000 in the sinking funds held against the debt brought the net increase to \$570,000. The gross debt October 1 consisted of funded obligations to the amount of \$20,411,000 and a floating debt of \$2,518,423.93. The sinking funds aggregated \$8,835,893.22, including \$297,167.19, which was the excess of receipts over expenditures on the waterworks during the year. Unexpended balances from all city departments at the close of the fiscal year totalled \$26,678.61, against a similar balance of \$73,890 a year ago. Some of the balances were carried forward into the appropriations for the current year, while the remainder went automatically into the reserve fund, where it is now available for general appropriation.

#### \$7,000,000 Bond Issues for Pittsburgh.

Pittsburgh, Pa.—The City Council, in conference with Mayor Joseph G. Armstrong, has approved bond issue ordinances aggregating \$7,000,000 and decided to submit the proposal for the issue to the people at a special election. No time was specified for the election, but it will be within the next few months, possibly in February. The items for which the money is to be used include widening, improving and changing grades on a number of streets, repairing and repaving paved streets, \$750,000; improvement of Saw Mill run as an open surface water drain between the Ohio River and the City Line, \$150,000; highways, bridges and viaducts, \$450,000; parks and playgrounds, \$390,000; for extension and improvements to water system, \$1,200,000.

#### Turns Down Commission Plan.

Billings, Mont.—By a majority of 389, 968 to 579, out of a total vote of 1,487, Billings turned down the proposition to change the city administration from the aldermanic system to the commission plan. Less than one-half of the total registered vote was cast at the special election. It was estimated that about 35 per cent of the votes cast were by women, who are newly enfranchised here.

#### Nashville Ouster Sustained.

Nashville, Tenn.—In the Circuit Court Judge Thomas Matthews sustained ouster proceedings against Mayor Hilary E. Howse, suspended from office under such proceedings on July 27 last. The grounds enumerated included failure to enforce the law, waste of the city's money and loose methods of managing the city's affairs. The proceedings against Robert Elliott, commissioner of waterworks, were dismissed. The hearing of the ouster case has been in progress for the past month. Mayor Howse will take an appeal to the Supreme Court. Commissioner Elliott automatically resumes his seat, which since summer has been filled by J. O. Tankard, elected by the remaining commissioners. Since Mayor Howse's suspension Robert Ewing has filled the office of Mayor, by election of the City Commission. On the witness stand Commissioner Elliott defended himself by giving an accounting of the conduct of his department, citing instances in which he claimed to have cut down expenses and raised the efficiency of the

waterworks system. Mr. Elliott testified that when he found that certain activities of the city were being carried on in what he considered an irregular manner he refused to be a party to them. Among these, he said, was the construction of the new market house, costing about \$13,000, contract for which he said was let without open bidding and payment for which was made in checks for less than \$500 each. The charter requires that contracts of more than \$500 be advertised and subject to open bids. Mr. Elliott said he investigated the matter after eight of the vouchers had been presented to him, and refused to endorse any more of them. He also told of his action when he found that the city was embarrassed financially, in which he told his fellow commissioners he was going to resign at once if the matter was not brought to the attention of a committee of leading citizens, and some action taken to reduce expenses and bring the city's finances back to normal condition. He denied having acted as a "politician" in office. In his discussion of the matters upon which he was questioned he showed familiarity with the city charter, which fact was commented upon favorably by Judge Matthews.

#### Commission Form Law Upheld.

Jefferson City, Mo .- Through an opinion filed by Judge Bond in the Supreme Court the act of the legislature of 1913, providing commission form of government for such municipalities as may choose to adopt it, was sustained. The suit came here from Kirksville, where the new form of government was adopted. The suit was filed by C. M. Barnes, who previously had been elected marshal of the city. He was let out by the commissioners and sued for his salary, and in doing so invoked two sections of the constitution prohibiting the legislature from passing local and special laws. The court holds that the act is valid ry particular. "The cases cited from other jurisdic-Judge Bond said, "demonstrate that Missouri was in every particular. tions," only following the trend of those measures of reform previously enacted in the leading cities of the Middle West and in other parts of the country for the eradication of inefficiency in the working of their governmental agencies. The union in their (the commissioners') hands of equal judicial as well as administrative authority does not violate the constitutions of the various states, since it has been uniformly held that the municipalities so governed are not in any sense sovereignties, and hence do not fall within the provisions of the constitution which apportion the powers of sovereign states."

#### RAPID TRANSIT

#### Railway Receivership After Jitney Competition.

Atlantic City, N. J.-Unrestricted operation of jitneys in Atlantic City, it has been given out, has made such great inroads in the receipts of the Atlantic City and Seashore Railroad Company, the trolley line in Atlantic City, that an application has been made in the Federal Court at Trenton for a receiver for the company. Immediately upon hearing the arguments Judge Rellstab named former Judge Clarence Cole receiver. The company filed its answer to the application and admitted its financial embarrassment. It was shown that for the five years prior to 1915 the profits of the company were \$200,000. the receipts have fallen off \$100,000, due, it is alleged, to the unrestricted operation of jitneys, showing a deficit of \$80,000 for the year. It is set up that at this time the road is being operated at a loss of \$300 a day. The bill asking for the appointment of a receiver showed that the company owes the complainants \$12,682.25 and has other debts amounting to \$35,000, and that the company is unable to meet these obligations. It is further shown that the company has \$950,000 of bonds outstanding at 5 per cent. interest, and there is \$23,873 interest due, which obligation the company is unable to meet. The Atlantic City and Seashore Railroad Company owns two miles of trackage and the necessary operating equipment in Atlantic City. It operates cars under trackage rights from the West Jersey and Seashore Railroad Company from the Atlantic City inlet to Longport, seven miles, and to Somers Point

and Ocean City, seventeen miles. It has been operated under the same management for nine years. During the term of the receiver the road will be operated under his authority without interruption. The receivership is the result of a long fight on the part of the company for a jitney ordinance to be passed by the City Commission. An ordinance was passed, but was immediately repealed upon protest of the jitneurs. The commission killed the bill which provided for the bonding of the jitney drivers and barred them from operating on any trolley route. The car company threatened to cut off service if the jitneys were not stopped. The commissioners point out that the traction company has refused to pay a franchise tax to the city and during fights in the courts over this very question has dodged the payment under a technicality-that the trolley road is a part of the main stem of the West Jersey Railroad. The commissioners charge that the stock of the company is highly "watered" and that the \$1,000,000 made in the last five years has not all been reinvested in equipment, as claimed.

#### Car Lines as Christmas Presents.

San Angelo, Tex.—J. D. Sugg, a wealthy citizen of this city, has offered the entire San Angelo street railway system to the city as a Christmas present. The city commissioners decided to reject the offer. Mr. Sugg asked that the city own and operate it during the life of the franchise, pay the 1915 taxes and make the extensions agreed upon. This was refused. It was announced that the cars would cease operations and tracks be taken up. Patrons of the system will be embarrassed by lack of service. There is a possibility the matter will be taken into the courts to retain the present service. It is understood the system has been unprofitable for several years.

Portvue, Pa.—Gilbert F. Myer, a wealthy real estate man and owner of the Portvue traction line, has offered that corporation with all its lines, equipment and franchise, free of debt, to the borough of Portvue as a Christmas present. All that is required of the borough is a promise that the line will be operated five years. The line has been running several years between Fifteenth avenue bridge, Mc-Keesport, to Realty avenue, Portvue. All equipment is modern and in good condition.

#### Street Car Franchise Perpetual.

Covington, Ky .- United States Judge Cochrane has decided that the South Covington & Cincinnati Street Railway Company, operating the surface lines in Covingholds a perpetual franchise from that city. issued an order enjoining the city from disposing of the street car franchise and from interfering with the operation of the cars by the present holding company.
The decision will be appealed immediately to the
United States Circuit Court of Appeals by City Solicitor Fred Schmitz, of Covington, it is stated, and will be carried to the United States Supreme Court. This is the present status of a bitter fight which was begun two years ago by Stephen Blakeley, then city solicitor of Covington. At that time the city officials contended that the street car franchise held by the South Covington & Cincinnati Street Railway Company had been granted for only 25 years and had therefore expired in 1892. Plans were made for granting a new franchise and an ordinance was passed in council to proceed with the making of a new contract for the operation of the street cars in the city. Attorneys for the company insisted that the franchise under which the lines were being operated had not expired, but was given for an indefinite period. The new street car ordinance was passed by the Covington Council in December, 1913, and the injunction suit was filed in January, 1914. Judge Cochran at that time issued a temporary order, enjoining the city from proceeding further in the matter until a final decision was reached. City Solicitor Schmitz declares that when the franchise expired in 1892 the Covington officials and the street car company officials agreed to postpone action on a new franchise for twenty years. This agreement expired in 1912, Mr. Schmitz says.

#### **MISCELLANEOUS**

#### Workmen's Compensation in Pennsylvania Cities.

Harrisburg, Pa.—Civil divisions in the state that have the right to levy and collect taxes are exempted by the Workmen's Compensation Board from the necessity of insuring their compensation liability. This is an important ruling which will relieve county, city, borough, school and township authorities of many difficulties. Under this plan where an employe of a civil division is injured the compensation is to be paid out of the city, borough or school treasury, as the case may be. This leaves the division to carry its own insurance.

#### City Planning Board Chosen.

Omaha, Neb.—George T. Morton, George B. Prinz, Everett Buckingham, Thomas A. Fry and George Brandeis have been appointed by the city council as members of the new city planning commission, their terms to run for one, two, three, four and five years, respectively. The law enacted by the last legislature provides that the commission shall acquire or prepare a city plan and shall have power to carry out and maintain the plan after its adoption by the city council. The law further provides that the commission, "acting for the city and through the city council, may acquire by gift, purchase or condemnation, real estate for laying out and enlarging waterways, streets, bridges, boulevards, parkways, parks, playgrounds, sites for public buildings and property for administrative, institutional, educational and all other public uses."

#### Minimum Wage Legislation in Cities.

Milwaukee, Wis.—The City Council adopted an ordinance making eight hours a legal day's work for the city, and establishing a minimum wage of \$2 per day on public work. The ordinance also specifies that the prevailing scales of wages shall be paid to skilled laborers on such work. An amendment was adopted stating that it does not apply to sub-contractors who supply the contractors employed by the city with materials. It also states that in an emergency laborers may be employed twelve hours on public work in which cases the city will pay the extra wages. The disposal of the ordinance closed a controversy in which union labor leaders worked for the passage of the measure and contractors worked against it. City Attorney D. W. Hoan is doubtful whether the ordinances will stand a test in court.

Aberdeen, Wash.—The Council has ordered an ordinance prepared fixing the minimum wage for employees of the city at \$2.50 a day. Mayor Phillips announced that he would veto an ordinance passed increasing the salary of the city enginer to \$250 a month from \$175 a month. There is an ordinance in force that prevents the increase of the salary of a city official during his term, though this has been ignored in times past.

#### City Officials Form Municipal Research Society.

Dallas, Tex.—"The Dallas Society of Municipal Research," composed of all department heads of the city government, the mayor and the board of commissioners and the president of the board of education, has been organized to study and initiate progressive, efficient and economical methods in municipal business affairs and to bring about a closer co-operation of the various departments of the Dallas city government, with a view to improving living conditions in Dallas and making the government of the great-est possible service to its citizens." The mayor will be exofficio president of the organization; members of the board of commissioners and the president of the board of education will be vice-presidents, these officials to act ex-officio without vote. An executive committee of seven members will be nominated by the president and approved by the society, and a secretary will be appointed in the same way. The by-laws of the organization will contain a clause whereby the activities of the society are to be confined strictly to study of municipal questions and improvements of city government, and will be kept entirely free from politics. It is necessary, Mayor Lindsley says, that department heads

have a general understanding of the accomplishments and efforts of each department, and he touched upon the necessity for department heads understanding and appreciating new departments and their importance to the community. The administration, Mayor Lindsley said, has plans for many things in the future. These include a municipal swimming pool, a municipal stadium for the development of amateur athletics, a pension plan for policemen and firemen, improvements of parks and play grounds, city forestation, appointment of a municipal purchasing agent, improvement of garbage removal and disposal system, creation of a municipal market, improvement of the tax assessing system, extension of the ornamental street lighting system, completion of a topographical survey of the city of Dallas, development and improvement of the city water supply and service, extension of sewer connections in Dallas and improvement of the public health.

#### Municipal Pier Nearly Completed.

Chicago, Ill.—The new 3,000-foot municipal pier at the foot of Chicago avenue is to be completed before Christmas, it has been announced by the Harbor and Subway Commission. Certain brickwork at the east end of the pier, the installation of electric lights over the 45-foot driveway and the installation of safety appliances will be the final steps in the completion of the pier, which will cost about \$4,250,000. The pier will not be open to the public until next spring.

#### Results of State Engineering Conference.

Trenton, N. J.-Although New Jersey has many laws for protection against injury by machinery and for safeguarding factory workers in other ways, it has absolutely no law for guarding against steam boiler explosions. condition was brought to light at the meeting of the conference of engineers of the various state departments held at the State House. There is no provision whatever for the state inspection of steam boilers. There is a statute for the examination and licensing of stationary engineers and firemen. Another point brought out at the conference was that there are three state departments dealing with the qustion of water companies and water supply, and that sometimes their recommendations work against each other. The state Board of Health may condemn a municipal water supply for sanitary reasons or the protection of the public health, and then the water company or the municipality must apply to the state Water Supply Commission for permission to take another source of supply. In the case of a water company, if the condemnation includes its plant and it is necessary to issue bonds to enlarge the plant, or build a new one, application must be made to the state Public Utilities Commission. In a recent case such a condition existed, so that on the one hand the company's plant has been condemned by the state Board of Health and it has been denied the right to issue securities by the Utilities Commission. The meeting showed that the state architect has been loaded up by the legislature with road building powers and many other duties in connection with state institutions that are not the province of an architect at all. It is expected that as the result of the meeting legislation will be sought to correct some of the conflicting statutes. The conference was recently established under one of the economy and efficiency laws, which directs that the engineers of the various state departments to have such conferences at stated times for the purpose of getting acquainted with each other's duties, overcoming needless duplication and in other ways seeking to bring about more economy and efficiency in the engineering work. At this meeting six state departments were represented, as follows: Conservation and Development, by Secretary and State Forester Alfred Gaskill, and State Geologist Henry Kummel; State Department of Health, by Dr. R. B. Fox Randolph and C. G. Wigley; the Department of Charities and Corrections, by State Architect Drew; the Department of Labor, by Engineer Joseph Spitz; the Department of Commerce and Navigation, by Henry J. Sherman, engineer of the Inland Waterway, and the Utilities Commission, by Secretary Alfred N. Barber.

#### LEGAL NEWS

A Summary and Notes of Recent Decisions-Rulings of Interest to Municipalities

#### Public Park-Sale-Consideration.

Sharp v. City of Guthrie et al .- A city vested with power to sell a public park may sell same to any grantee it may choose, on a good and sufficient "consideration," as defined in Rev. Laws 1910, Sec. 926.-Supreme Court of Oklahoma, 152 P. R., 403.

Validity of Ordinance-Uncertainty.

Corporation of Town of Hammond v. Badeau.-An ordinance should be framed in terms sufficiently clear and definite to show what it intends to require, or prohibit, and punish; otherwise, it is void for uncertainty.—Supreme Court of Louisiana, 68 S. R., 850.

Claims Against the City—Necessity of Presentation. Sugg et al. v. Town of Greenville.—Revisal, § 1384, providing that no person shall sue any city or other municipal corporation for any debt or demand whatsoever, unless the claimant shall have made a demand upon the proper municipal authorities, does not apply to actions on contract for unliquidated damages, nor to torts.—Supreme Court of North Carolina, 86 S. E. R., 695.

Street Improvement-Mistake in Numbering-Effect.

Jones v. City of Sheldon.-Where the identity of the resolutions under which a street improvement was made was complete, the fact that through a mistake of the city clerk in numbering the resolutions the record erroneously showed that one of them was illegally passed does not invalidate it, since the numbering serves only the purpose of identification which was complete without resort to the record.-Supreme Court of Iowa, 154 N. W. R., 592.

Probation Officers-Compensation and Powers.

People ex rel. Kelly et al. v. Dooley, Acting Chief Magistrate, et al.-Where the board of estimate and apportionment provides in the budget for salaries for a less number of probation officers than those employed, the probation officers not selected by the board of city magistrates to receive such salaries remain probation officers, possessing the power of such officers, but receiving no compensation for their services.-Supreme Court, Appellate Division, Second Department, 155 N. Y. S., 326.

#### Sewers-Contract for Construction-Specifications.

Meeker et al. v. City of Madison.-The specifications in a contract for construction of a sewer for a city: "Pipe lay-The ends of the pipe are to abut close against each other in such a manner that there shall be no shoulder on the interior. . . . Pipes shall be joined by filling the sockets with mortar mixed . . . as specified. . . Great care must be taken to make the joints as nearly water-tight as possible"-requires nothing to be done to make the joints tight other than filling the sockets with the proper mortar, using great care therein.—Supreme Court of South Dakota, 154 N. W. R., 648.

#### Assessment of Benefits-Statutory Provisions.

Mayor and City Council of Baltimore et al. v. Cahill-Acts 1914, c. 470, prohibiting the city of Baltimore from levying or collecting any assessments for benefits in connection with the opening of the Key highway from Light street to Lawrence street, under Acts 1910, c. 485, is unconstitutional, as creating an arbitrary and unreasonable exemption from taxation, not based upon a proper and reasonable classification, as it discriminates between owners of property benefited by the opening of such highway and the owners of property abutting on other streets, and discriminates between the owners of property abutting on different streets opened under the same act, and even on different portions of the same street, especially as the assessments had been made and had become final, except as to those property owners who had appealed before the act of 1914 was approved.-Court of Appeals of Maryland, 95 A. R., 475.

#### THE MUNICIPAL INDEX

#### In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

#### ROADS AND PAVEMENTS.

ROADS AND PAVEMENTS.

Highways:
Rural Highways. Analysis of construction, including foundations, methods of construction, seam rolling, binding materials, scarifying and repairs. From a paper by Arthur Gladman. 4,000 words. Canadian Engineer, November 18, 15 cts.
Over \$8,000,000 Voted for Roads in Southern Appalachian Territory. A complete list of road improvements made and of work to be undertaken. 1,500 words. Manufacturers' Record, November 4, 15 cts.
Object Lesson Road Work in Twelve States. Gives the work done during the last eighteen months in the counties and states. 1,750 words. Southern Good Roads, November. 10 cts.
Road Work in Berrien County, Michigan. Describes conditions in the county and the type of roads built to meet these conditions. Method of construction. By Stanley E. Bates. 10 ills., 7,000 words. Better Roads and Streets, November. 19 cts.

Better Roads and Streets, November. 19 cts.

Highway Work in New York. Experimental pavements; curbs, catchbasins and other details; paving between rails. 2,000 words. Municipal Journal, November 4. 10 cts.

How the World's Highest Highway Became A Reality. Description of the work of building the Pikes Peak highway. 4 ills., 2,500 words. Better Roads and Streets, November. 15 cts.

Convict Laber:

How Colorado Employs Prison Labor. Quotes law under which convicts are now being employed on road work and describes some of the successful jobs completed. By J. E. Maloney. 3,000 words. Better Roads and Streets, October. 15 cts.

completeu.
words. Better Roads and S.
ber. 15 cts.
Public and Private Interests Cooperate to Pave an Important Chicago
Street, Using Prison Labor. By Stanley
E. Bates. 7 ills., 3,000 words. Better
Roads and Streets, October. 15 cts.

E. Bates. 7 ills., 3,000 words. Better Roads and Streets, October. 15 cts.

Maintenance:
Cost of Road Revair and Maintenance, Niagara Falls Park. Cost data from the park superintendent relating to heavy and light resurfacing of water-bound macadam roads. 1,500 words. Canadian Engineer, November 4. 15 cts.
Resurfacing Old Roads. Discusses waterbound and bituminous macadam, bituminous concrete and sheet asphalt resurfacing; vitrified and other block pavements. From a paper by W. D. Uhler, Chief Engineer. Pennsylvania State Highway Department. 2,500 words. Better Roads and Streets, October. 15 cts.
The Surface Oiling of City Streets. Describes the kind of oil to use and gives directions for the preparation of the oil; results to be expected. By T. R. Agg. 3,000 words. Better Roads and Streets, October. 15 cts.
Roadway Surfacings. Enumerates materials available for highway use and discusses the popularity of each type. By F. F. Rogers, State Highway Commissioner of Michigan. 2,000 words. Better Roads and Streets, October. 15 cts.

Construction:
Construction Progress on the Twin
Peaks Tunnel. Describes work on large
highway tunnel on line of Market Street,
San Francisco. By A. J. Cleary. 5 ills.,
1,200 words. Engineering News, Novem-

1,200 words. Engineering News, November 4. 15 cts.
Location and Grading of Side Hill Roads. Discusses grades and describes methods of locating roads when it is necessary to construct them on steep slopes. By E. W. Murray. 2,500 words. Canadian Engineer, November 11. 15 cts. Building A Road Up the Palisades, Describes the work of constructing a road to carry heavy traffic on an easy grade up the steep slopes of the Palisades at New York City. The road is

paved with brick and is guarded by a heavy parapet wall. 5 ills., 1,750 words. Engineering News, November 18. 15 cts. Alpine Road Building in the Hudson River Valley. Describes the construction of a road which is carried along a mountainside by dry masonry retaining walls. 6 ills., 700 words. Engineering News, November 25. 15 cts.

Construction and Maintenance of Rural Highways. Discusses width of roads for various volumes of traffic; maintenance and repairs; construction. By Alfred Dryland. 3,500 words. The Surveyor, October 29. 40 cts.

Asphalt: Asphalt:

Asphalt Repairing in Manhattan.

Method of using tractors economically for short haul on street repairs; comparison with horse traction; organization of street gangs, equipment and schedule of street work. 3 ills., 1,750 words. Municipal Journal, November 4. 10 eta.

words. Municipal Journal, November 4. 10 cts.

Experience in Repairing Sheet Asphalt with Home-Made Plant at Norfolk, Va. Gives a description of the plant. Describes methods of repairing sheet asphalt pavement and gives some costs. 2.000 words. Engineering & Contracting, November 3. 10 cts.

Operating Manhattan Asphalt Plant, Gives an account of the work done during the first year and describes the plant, the force employed, the duties of the men, the schedule of operation and the improvements to the plant suggested by the superintendent after a year of operation. 5 ills., 2,000 words. Municipal Journal, November 18. 10 cts.

Street Repair in Cleveland, Ohio. Describes the work of the department, including material supply, use of motor trucks and their economy, operation of the asphalt plant, and the amount and cost of the street repairs. 3 ills., 7,000 words. Municipal Engineering, November. 25 cts.

Bituminous:

Bituminous:

Types of Bituminous Construction.
Classifies the various methods of using bitumen in road construction and describes bituminous construction of all kinds from simple oiling of earth roads to asphalt or bitulithic pavements. By F. P. Smith. 5,500 words. Municipal Engineering, November. 25 cts.

Precautions To Be Used in Securing Successful Bituminous Macadam Pavements. Discusses foundations, materials, bottom course, penetration and mixing methods. By P. P. Sharples, Barrett Manufacturing Company. 5 ills., 3,000 words. American City, November. 35 cts.

words. American City, November. 3s cts.

The Comparative Value of Penetration Roads. By Daniel T. Pierce, Barber Ashalt Paving Company. 8 ills., 2,500 words. Good Roads, November 6. 10 cts.

Brick:

Some Brick Paving Lessons Learned in Overcoming Faults of Original Designs, Greenville, Texas. Describes method originally employed in laying vertical fibre brick. Also describes the method of laying under present specifications. 3 ills., 2,500 words. Engineering and Contracting, November 17. 10 cts.

Green Concrete Base for Brick Pavement. Description of the laying of experimental roads in Illinois. By F. A. Churchill. 3 ills., 1,200 words. Better Roads and Streets, October. 15 cts. Bricks

Roads and Streets, October. 15 cts.

Conerete:
Method of Constructing Concrete Road in Freezing Weather. Several methods for preventing injury to concrete by cold weather. By H. C. Campbell. 1 ill., 1,200 words. Engineering and Contracting, November 3. 10 cts.

Model Concrete Road at Sarnia, Ontario. Description of construction of about one mile of concrete road, constructed according to specifications of Office of Public Roads. 2,500 words. Canadian Engineer, November 4. 15 cts.

Reinforced Concrete Street Paving in Believue, Michigan. Efficient equipment and methods were used; machinery. 5 ills., 1,200 words. The Contractor, November 1. 20 cts.

New and Different Specification for Concrete Roads. Differs from the old specification in respect to the proportioning of the mixture. Presented at recent meeting of American Society for Municipal Improvement, 3,000 words. Engineering and Contracting, November 17. 10 cts.

Note on Methods and Cost of Grouting Granite Block Pavement. Describes the practice in several cities and gives other information concerning granite block pavement. 2,000 words. Engineering and Contracting, November 3. 10 cts.

Joint Fillers for Granite Block Pavement. Requisites of a good filler; mixed asphalt and tar; mixed sand and bitumen; importance of filling joint. From a paper by C. D. Pollock. 2,000 words. Municipal Journal, November 18. 10 cts. Granite:

Municipal Journal, November 18. 10 cts.

Gravel;

Experiments With Gravel Roads in Iowa. Road bed preparation is outlined, also hints on rolling, on removing waves and on necessity of preventing rather than removing ruts during first year. By T. R. Agg. 4 ills., 2,500 words. Engineering Record, November 20. 10 cts.

Wood Block:
Laying Creosoted Wood Blocks on 5 Per Cent Grades. Blocks with ½-inch creosoted wood strip in joints on an elevated wood superstructure. By J. R. West. 2 ills., 800 words. Engineering News, November 11. 15 cts.

Road Olis:

West. 2 ills., 800 words. Engineering News, November 11. 15 cts.

Road Oils:

Road Oil Test for Loss on Heating Needs Revision. Due to the convection currents in heating ovens now used, there is a wide variation in evaporation. By Norman Chivvis, Chief Chemist, Municipal Testing Laboratory, St. Louis. 2 ills., 1.500 words. Engineering Record, November 6. 10 cts.

Essential Physical and Chemical Requirements of Creosoting Oils For Wood Block Pavements. By S. L. Churca. 10 ills., 12,000 words. Better Roads and Streets, November. 15 cts.

The Practical Testing of Asphalt and Road Oil. Describes the necessary tests and gives procedure. From a paper by T. A. Fitch. 2,500 words. Engineering and Contracting, November 10. 10 cts.

Miscellaneous:

and gives procedure. From a paper of and Contracting, November 10. 10 cts.

Miscellaneous:

The Determination of Justifiable Outlay for Specific Cases of Highway Improvement. Discusses design of roads for various classes of traffic and the problem of securing an adequate return for the money expended. By Clifford Richardson. 1,500 words. Better Roads and Streets, October. 15 cts.

Equipment for Highway Work. Discusses a selection of equipment; factors that should be considered. By Arthur H. Blanchard. 3,500 words. Better Roads and Streets, October. 15 cts.

Road Drainage and Foundation. The importance of drainage in road construction is emphasized. Describes methods of securing foundations in swampy country. From a paper by Geo. W. Cooley. 1,300 words. Canadian Engineer, November 11. 15 cts.

Proper Rolling of Plastic Pavements. Discusses the correct method of operating roller on various types of pavements: weights, time of rolling and number of rollings. By Edward Wright. 1 ill., 1,000 words. Good Roads, November 6. 10 cts.

Papers Presented at the Pan-American Road Congress. Dust Suppression and Street Cleaning, by William H. Connell; Equipment for Highway Work. by Arthur H. Blanchard: Highway Bridges and Structures, by W. S. Gerhart; Uniformity for Highway Statisties and Data, by H. E. Breed. 21,500 words. Good Roads, November 6. 10 cts.

#### SEWERAGE AND SANITATION.

Treatment:
Activated Sludge At Milwaukee. Recent information concerning the tests being made; effect of low temperature; plant for continuous operation; results and costs of treatment. 1,500 words. Municipal Journal, November 18. 10 cts. Activated Sludge Installation at Milwaukee. Some notes on the new plant under construction for treatment of 1,600,000 gals. of sewage daily by this method. 2 ills., 1,500 words. Canadian Engineer, October 28. 15 cts. Activated Sludge Treatment Costs. Estimates are derived from extensive experiments at Milwaukee. From a paper by T. C. Hatton, Chief Engineer, Milwaukee Sewerage Commission. 2 ills., 1,200 words. Canadian Engineer, November 4. 15 cts.

kee Sewerage Commission. 2 ills., 1,200 words. Canadian Engineer, November 4. 15 cts.

Marysville, Ohio, Sewage Treatment Plant Provides for High Degree of Purification. Screening, two-story sedimentation tanks, crushed stone contact beds and intermittent sand filters were found necessary. By E. V. Barstow. 1,500 words. Engineering Record, November 20. 10 cts.

The Slate Bed Biological Sewage Disposal Process. Gives a description of the process; amount of sludge, cost of the process; amount of sludge, cost of beds and general results of experience. 4 ills., 4,000 words. Water and Water Engineering, November 15. 40 cts.

The Oxidation of Sewage Without the Aid of Filters. The third in a series of articles by E. Ardern and W. T. Lockett. 2 ills., 7,500 words. Surveyor, October 29. 40 cts.

The Spa Sewage Works, Ossett. Describes works recently put in service. By H. Holmes. 1,500 words. Surveyor, November 5. 40 cts.

Disposal of Greater New York Sewage. Discusses the general plan proposed by the Metropolitan Sewerage Commission and the Board of Estimate: digesting power of harbor; local nuisances. 1 ill., 3,000 words. Municipal Journal, November 4. 10 cts.

Boston's New Sewage Pumping Station. Has a capacity of more than 1,700 gallons per second; is for intermittent use; centrifugal pumps, motor driven, automatically stopped and started. By W. B. Conant. 2 ills., 1,500 words. Municipal Journal, November 18. 10 cts.

pal Journal, November 18. 10 cts.

Sewers:

How to Prepare Trenches, Lay Pipe and Backfill Sewers. Recommendations of American Society for Testing Materials for laying sewer pipe. 1,750 words. The Contractor, November 1. 20 cts.

Location and Laying of Sewers. Discusses location, planning the layout, getting line and grade and selecting material. By F. R. Charles, City Engineer, Richmond, Indiana. 3,000 words. American City, November. 35 cts.

How Deep Sewers Are Being Built in Joliet, Illinois. Trenching machine and power backfillers are successful in handling difficult work. 3 ills., 1,200 words. The Contractor, November 1. 20 cts.

Building A Deep Sewer and Disposal Plant At Moline, Illinois. Modern methods and efficient machinery were used in handling materials excavated from rock trench. Two efficient plants were used. By Charles P. Stivers. 5 ills., 1,500 words. The Contractor, November 16. 20 cts.

Keele Street Sewer System, Toronto. First of a series of articles descriptive of engineering features of a recently installed storm overflow sewer for the western section of the city. 6 ills., 1,250 words. Canadian Engineer, November 18. 15 cts.

Choosing Air Compressors for Activated Conduct Testing Position of the city.

words. Ca 18. 15 cts.

words. Canadian Engineer, November 18. 15 cts.
Choosing Air Compressors for Activated Sludge Tanks. Reciprocating compressors, turbo-blowers and positive-pressure blowers are considered in detail and the possibility of utilizing the fall of sewage in a shaft to compress air is briefly discussed. By C. H. Nordell. 2 Ills., 3,000 words. Engineering News, November 4. 15 cts.
Relative Stabilities in Polluted Waters Carrying Colloids. Results of experiments for their determination by the methyline blue and the available oxygen method. By Arthur Lederer. 2.500 words. Canadian Engineering, November 11. 15 cts.
Separation of Grease from Sewage. Outline of experiments using sulphur dloxide gas for separation of fats instead of sulphuric acid. 2,800 words. Canadian Engineer, November 4. 15 cts.
Surface Drainage in Relation to Sewage Purification. Futility of trying to obtain pure lake water by purifying sewage beyond pollution point of ordi-

nary surface water is emphasised. From a paper by Geo. H. Norton. 1,000 words. Canadian Engineer, November 11. 15

Canadian Engineer, November 11. 10 cts.

Plan for Condensing Water Supply for Fall River. Four conduits are carried in a 3-story reinforced concrete structure to convey lake water for power, divert sewage, turn surface water into a pond or river and carry condenser water. By H. S. Knowlton. 1 ill., 2,000 words. Power, November 9, 5 cts.

Topographic Survey of the City of Dayton. Survey of 25 square miles made in connection with designs of sewerage system. By R. H. Randall, Engineer in Charge. 1 ill., 800 words. Engineering News, November 11. 15 cts.

#### WATER SUPPLY.

Water Supply:

Water Supply and Power at Medicine
Hat. Describes a unique municipal development, comprising water supply and
filtration, and gas generated electrical
power. 12 ills., 1,800 words. Canadian
Engineer, October 28. 15 cts.
Sooke Lake Water Supply, Victoria.
B. C. Some further details of the extensive undertaking, including cost data
on pipe lines, reservoir, dam, etc. By
C. H. Rust, City Engineer. 4 ills., 2,500
words. Canadian Engineer, November
18. 15 cts.

on pipe lines, the control of the co

15 cts.

11. 15 cts.

Reconstruction of Hamilton, Ontario, Water Works. Some interesting methods of overcoming difficulties and some valuable cost figures are given. By A. F. Macallum, city engineer. 7 ills., 3,000 words. Municipal Engineering, November. 25 cts.

Purification:

7. Macanim, city engineering, November. 25 cts.

Purification:

Wakefield Water Sterilization. Is the only community in Massachusetts using liquid chlorine for this purpose; results of first year's service; cost of plant and operation. From a paper by E. C. Sherman. 1 ill., 1,000 words. Municipal Journal, November 25. 10 cts.

Toronto Filtration Plant Construction. Describes progress on the new 60,000,000-gallon per day drifting sand filtration plant now nearing completion. 8 ills., 1,200 words. Canadian Engineer, November 25. 15 cts.

Treatment of Water with Hypochlorite. Notes from a paper dealing with some important points, including effect of temperature, turbidity, efficiency, materials for plant construction, etc. By Joseph Race. 4,000 words. Canadian Engineer, November 25. 15 cts.

Softening Plant Converts Hard Impure

Canadian Engineer, November 25. 15 cts.
Softening Plant Converts Hard Impure River Water Into Boller Feed Supply. Installation at Youngstown Tube Mill purifies 4,000,000 gallons daily by means of reaction and settling plants and mechanical filters. Unique strainers are used in filters. 3 ills., 3,000 words. Engineering Record, November 20. 10 cts. Pipes:

Ten and Three-Quarter Miles of 36-in.

gineering Record, November 20. 10 cts. Pibes:
Ten and Three-Quarter Miles of 36-in. Riveted Steel Pressure Line Built on Sooke Work. The pipe sections were fabricated in a work shop from the plate. Snilt calking done inside and out of all seams, air hammers being used. By Boyd Ehle, Resident Engineer. 2 ills. 1,500 words. Engineering Record. November 6. 10 cts.
Joints For Wrought Iron and Steel Pine. Describes the development of present commercial pipes. The joints have until recent vears been threaded. By R S. Lord 1 ill., 2,000 words. Engineering News, November 25. 15 cts. Curves on the Winning Aqueduct Built With Straight Sections of Form. Construction of special forms for curves avoided by setting 15-ft. form sections on chords to curve. Delay in moving forms ahead through curves avoided by careful planning of construction work. 2 ills., 1,200 words. Engineering Record, November 27. 10 cts.
The Greater Winnipeg Water Dis-

tricts. A description with special reference to the work of the Winnipeg Aqueduct Construction Company, Ltd., and the use of small dragline excavators. 9 ills., 2,500 words. The Excavating Engineer, November. 10 cts.

Building Invert of Milwaukee Intake Tunnel. The invert was built after the arch and sidewalls. Concrete delivered in place by dump cars. By L. G. Warren. 1 ill., 950 words. Engineeriag News, November 4. 15 cts.

Pumping:

arch and sidewalls. Concrete derivered in place by dump cars. By L. G. Warren. 1 ill., 950 words. Engineering News, November 4. 15 cts.

Pumping:

How Low Fixed Charges Favor Centrifugal Pump. Comparison of economic results with Kirtland station centrifugal unit in Cleveland and Bissell's Point triple expansion engine in St. Louis. By G. H. Gibson. 2 ills., 1,800 words. Engineering News, November 4. 15 cts.

Miscellaneous:

Performance of the New Orleans Water, Sewerage and Drainage System During the Recent Hurricane. 3,000 words. Engineering and Contracting, November 17. 10 cts.

Cushioning Standpipe Bases. Use of sand with or without cement; experience in grouting tank while empty; grouting under cone-shaped bottom. From a paper by C. W. Sherman. 1,000 words. Municipal Journal, November 25. 10 cts.

Well Designed Concrete Plant Aids Construction of Waterworks Dam. Large capacity plant, arranged for handling concrete materials mechanically from gravel pit to farms, enabled small force to make good progress in building a 12,000-yard concrete dam and local gravel supply. 6 ills., 1,800 words. Engineering Record, November 13. 10 cts.

Repairing a Submerged Water Main.

Engineering Record, November 13. 10 cts.

Repairing a Submerged Water Main. Some notes on Edmonton water supply system and on the repair of a pipe section submerged in the South Saskatchewan river. By James Hamilton, Assistant Engineer. 3 ills, 1,200 words. Canadian Engineer, November 4. 15 cts. Valuation of Water Works Property. The seventh of a series of articles by Halbert P. Gillette, Editor-in-chief. This one discusses the appraisal of working capital. 1,700 words. Engineering and Contracting, November 3. 10 cts.

#### STREET LIGHTING AND POWER.

A Year's Development in Lighting. A Year's Development in Lighting. Discusses gas lamps and appurtenances, automatic lighters, heating value of gas, electric incandescent lamps, are lamps and lamps for other purposes. Report of Illuminating Engineering Society Committee. 9,500 words. American Gas Light Journal, November 1. 10 cts. Planning Lighting Installations. Discusses the three general factors to be considered in determining the kind of lighting installation. By R. F. Pierce. 2 ills., 3,000 words. American Gas Light Journal, November 22. 10 cts.

Parallel vs. Staggered Arrangement of Lamps. An investigation of the relative merits of the two systems of installing ornamental street lighting standards. By H. E. Butler. 7 ills., 1,000 words. Electrical World, November 6. 10 cts.

Power Plants.

Combination Electric Heating Plant at Laramie, Wyo. This power plant nat only generates electrical energy, but the exhaust steam from the engines is used for district steam heating about nine months in the year. By A. E. Anderson. 5 ills., 2,250 words. Power, November 2. 5 cts.

Owego Light and Power Plant. A remodeled combination hydro-electric en-

months in the year. By A. E. Anderson. 5 ills., 3,250 words. Power, November 2. 5 cts.

Owego Light and Power Plant. A remodeled combination hydro-electric engine and turbine-driven steam plant. Various generating units can be operated in parallel or singly. By Gilbert Newell. 4 ills., 1,000 words. Power. November 30. 5 cts.

Gas Engines Replace a Steam Turbine Power Plant. Bad boiler feed and condensing water was responsible formany shut-downs in the steam plant. Three gas engines were installed, each driving a 1,250 k. w. generator. The smaller amount of water required for the gas engine plant was a deciding factor. By C. L. Follmer. 4 ills., 3,000 words. Power, November 16. 5 cts.

Supplemental Power for Hydro-electric Plants. Outline of functions of steam and other plants for relay and supplemental work. Gives classification and plant types. From a paper by J. F. Yaughan. 3,500 words. Canadian Engineer. November 4. 15 cts.

Auxiliary Steam Power Plant for Vancouver Island. A steam turbine-driven plant of 4,000 k. w. capacity. Burns oil

fuel; oil regulating system. By W. L. Kidston. 4 ills., 2,500 words. Power, November 9. 5 cts.

Gas:

The Great Gas Tunnel Under the East River. Describes the work of construction and the difficulties encountered in the construction of the Astoria-Bronx gas tunnel. By J. F. Springer. 6 ills., 2,500 words. Scientific American, October 30. 10 cts.

Miscelianeous:

Selecting Construction Power Plant System. Advantages of steam, electricity, gasoline and compressed air for various services. Experience of engineers and contractors. 3,400 words. Engineering News, November 18. 15 cts. A Study of Boiler Losses. Results of numerous tests made to permit of a detailed study of the boiler and furnace losses under varying conditions of load, depths of fuel bed and draft. By A. P. Kratz. 14 ills., 5,000 words. Power, November 3. 5 cts.

The Sale of Current to Municipally Owned Distributing Systems by Central Stations. Gives data on 12 towns and discusses the characteristics of each. From a paper by W. R. Colller. 6 ills., 4,000 words. Electrical Review, November 13. 10 cts.

Stone and Irrigation Dams. Describes the use of masonry in the Roosevelt and Pathfinder dams. By Mrs. L. L. Littlepage. 2 ills., 2,000 words. Stone, November. 15 cts. The Great Gas Tunnel Under the East

#### FIRE EQUIPMENT.

FIRE EQUIPMENT.

Apparatus:
Lightning Protective Apparatus for Fire and Police Telegraph Circuits. Discusses design of various types of arresters and their location for best protection of the circuits. From a paper by L. S. Brach. 2,000 words. Fire and Water Engineering, November 3. 10 cts. Practical Efficiency of Motor Apparatus in Winter Weather Under All Conditions. From a paper by John Aitken, Chief, London, Ontario. 1,000 words. Fireman's Herald, November 6. 5 cts. Protection:

Chief, London, Ontario. 1,000 words. Fireman's Herald, November 6. 5 cts.

Protection:

Fire Conditions in Springfield. Report of the National Board of Fire Underwriters on Springfield, Illinois. Describes the station houses and fire alarm systems. 3,000 words. Fire and Water Engineering, November 10. 10 cts.

Portsmouth Fire Department, equipment and recommendations. 1,800 words. Fire and Water Engineering, November 3. 10 cts.

New Bedford's Central Fire Station. Plans for new station to cost \$100,000 are completed. A separate room will be provided for each fireman. Description of buildings. 1,000 words. Fireman's Herald, November 27. 5 cts.

Roanoke's Fire Department. Report of National Board of Fire Underwriters states department to be efficient but undermanned. Drill school training is excellent. 2,000 words. Fireman's Herald, November 27. 5 cts.

The Fire Service of Manchester. Report of the National Board of Fire Underwriters on Manchester, New Hampshire. Describes equipment and methods of fire department. 3,500 words. Fire and Water Engineering, November 3, 10 cts.

#### STREET CLEANING AND REFUSE DISPOSAL.

Street Cleaning:

Motor Street Sweepers Save Time and Money. Describes the three types, pneumatic or suction, flushing or revolving broom with pick-up arrangement. 8 fills., 3,500 words. Commercial Vehicle, November 15. 20 cts.

Refuse Disposal:

Refuse Collection and Disposal. Gives information from several hundred cities concerning the methods and cost of collecting garbage, ashes and other refuse and of disposing of them. Also gives and of disposing of them. Also gives kinds of cans and carts used, details of incineration and reduction and itemized costs. 17 pages. Municipal Journal, November 11. 50 cts.

Garbage Collection and Incineration in Sewickley, Pa. Cans are furnished by the borough. Are not emptied but are carried to the furnace, clean cans being left in their place. Gives cost per year for collection and incineration. By E. E. Duff, Jr., City Engineer. 5 ills., 2,000 words. Municipal Journal, November 11, 50 cts.

Refuse Incinerator At Portland, Oregon. Method of operating plant; force employed; analysis of refuse burned; itemized operating expenses. No revenue is derived from the plant. By W.

G. Helber. 1,000 words. Municipal Journal, November 18. 10 cts.
Refuse Collection. A synopsis of the information given in tables of November 11 issue and some additional information as to kinds of refuse collected, classification and vehicles used. 1 ill., 4,000 words. Municipal Journal, November 25. 10 cts.

classification and vehicles used. 1 ill., 4,000 words. Municipal Journal, November 25. 10 cts.

Requirements for Refuse Receptacles. Materials and sizes specified by several scores of cities for garbage, ash and rubbish receptacles; where collected from. 4,000 words. Municipal Journal, November 18. 10 cts.

Fertilizer From Municipal Waste. Fractices and possibilities of using street sweepings, garbage and dead animals for this purpose and the probable cost and profit. 1,800 words. Municipal Journal, November 11. 50 cts.

#### TRAFFIC AND ND TRANSPORTA-TION.

Rapid Transit:

Development of New York's Rapid Transit System Resulting in Dual Contracts. Historical sketch of advances made in facilities for handling local traffic. Basis of final agreements and additions resulting from active construction now under way. Map shows new and old lines. 1 ill., 2,500 words. Engineering Record, November 6. 10 cts.

Engineering Record, November 6. 10 cts.

Ornamental Concrete Elevated Railway, New York City. Vaulted arch construction solved the problem of building something better than ordinary open floor steel elevated structure on Queens Boulevard. By M. E. Griest, Assistant Designing Engineer. 9 ills., 3,900 words. Engineering News, November 11. 15 cts.

words. Engineering News, November 11.
15 cts.

Motor Trucks:

Trailer Economy Makes Trucks More Efficient. Part 1 discusses the savings that can be effected by the use of trailers where loads are heavy, bulky, or where loading conditions are poor. 35 ills., 3,000 words. November 1. Part 2 discusses construction and sizes of trailers and specifications of those models carried in stock by the manufacturers. 16 ills., 3,500 words. Commercial Vehicle, November 15. 20 cts.

Horse vs. Motor Transportation of Materials. Analysis of a specific case comparing economy and service of a 5-ton gasoline truck with a 2-horse team. 2,000 words. Canadian Engineer, November 11. 15 cts.

Electrics that Work for Cities. Discusses municipal service as a field for electric trucks and shows the field for which they are suited. From a paper by A. J. Slade and R. D. Dumont. 4,000 words. Commercial Vehicle, November 1. 20 cts.

Bus Bodies for City and Interurban

which they are suited. From a paper by A. J. Slade and R. D. Dumont. 4,000 words. Commercial Vehicle, November 1. 20 cts.

Bus Bodies for City and Interurban Work. Describes several types of buses to use in cities and for interurban traffic. 6 ills., 1,500 words. Commercial Vehicle, November 15. 20 cts.

Miscellaneous:

Track Elevation on the Nickle Plate Railroad of Chicago. Conditions necessitated abandoning the original line and building an elevated line on a new location. The line has to rise to cross one railway and then rise again to connect with one of the latter. 6 ills., 1,600 words. Engineering News, November 4. 15 cts.

Elimination of Tower Grove Grade Crossing at St. Louis Completed. Two interesting streets crossing two nonparallel railroads make complex problem. Streets are carried over tracks on reinforced concrete viaducts. 6 ills., 2,500 words. Engineering Record, November 20. 10 cts.

Causes of Truck-Tire Breakdown, Discate the contraction of the contraction of skid-

reinforced concrete viaducts. 6 ills., 2,500 words. Engineering Record, November 20. 10 cts.

Causes of Truck-Tire Breakdown. Discusses overloading, overspeeding, skidding, bad roads, neglected cuts and running in car tracks. From a paper by A. H. Leavitt, 8 ills., 1,000 words. Firemen's Herald. November 6. 5 cts.

Terminals, the Need of Inland Water Transportation. Report of engineers says that, in order to revive Mississippi river traffic, every port town, large or small, must build suitable terminal faculties. 1,000 words. Engineering Record, November 6. 10 cts.

#### GOVERNMENT AND FINANCE.

Finance:
Some Notes on Municipal Finance.
Gives methods of repayment of permanent loans, compares the methods and gives the advantages of each. From an address by Thos. Bradshaw. 8,000 words.
Municipal World, November. 10 cts.
Rational Budget Making. Editorial.

Discusses the makeup of the city budget and gives table showing relative expenditures of cities over 30,000 population; table for calculating apportionments. 2,250 words. Municipal Journal, November 4. 10 cts.

Miscellaneous:
Contracts by Municipal Officers. Liability of a Municipality on an unauthorized contract made by an official; how it may be ratified; contracts outside the powers of the corporation never binding. By John Simpson. 1,700 words. Municipal Journal, November 25. 10 cts.
Alternate Specifications for Public Work Are Legal. Gives a review of recent leading court opinions. By Daniel T. Pierce. 2,400 words. Engineering News, November 25. 15 cts.

Park Utilities. The last of a series of four articles representing chapters from

Pierce. 2,400 words. Engineering News, November 25. 15 cts.

Park Utilities. The last of a series of four articles representing chapters from book by George Burnap on "Park Design," now in the publisher's hands and to be issued as the first of four volumes by him on the general subject of Landscape Architecture. 11 ills., 3,000 words. The American City, November. 35 cts.

Building—Area, Height and Other Limitations to Use of Private City Property Compiled. Practices in American and European cities presented by Nelson P. Lewis in paper on city planning read before International Engineering Congress. 2,500 words. Engineering Record, November 13. 10 cts.

Municipal Exhibit at Dayton. Arranged to show citizens what their public works are like and to interest school children. 2 ills., 2,000 words. Municipal Journal, November 4. 10 cts.

Municipal Markets. Enumerates the advantages of municipal markets and discusses the factors to be considered in its makeup. By D. E. McKenzie. Municipal market clerk, New Westminster, B. C. Canadian Municipal Journal, November. 15 cts.

Design of a Sewage Disposal Scheme for a Town on Seacoast. Discusses period and point of discharge into the sea. By C. J. Yorath, City Commissioner, Saskatoon. Canadian Municipal Journal, November. 15 cts.

Comparative Merits of Four Types of Location of Underground Utility Lines. Divides methods of handling public utility structures into four classes: location beneath pavements, under sidewalks, in large sewers and in pipe subways or galleries. Discusses each. 3,500 words. Engineering and Contracting, November 3. 10 cts.

Chicago Builds Its First Utility Gallery. Constructed through co-operation hetween city, public utilitities and the

Engineering and Contracting, November 3, 10 cts,
Chicago Builds Its First Utility Galery. Constructed through co-operation between city, public utilities and the new union station company. 2 ills, 1,000 words. Engineering Record, November 13, 10 cts.
Municipal Development in Calgary. An outline of the development of street rallways, water works, sewers, streets and bridges. 1,500 words. Canadian Engineer, November 25, 15 cts.

#### BRIDGES.

Bridges:
Reinforced Concrete Bridges. Abstracts from American Railway Bridge and Building Association report on general design and construction of reinforced concrete railway bridges. 2,000 words. Canadian Engineer, November 15 cts.

forced concrete railway, words. Canadian Engineer, November 25. 15 cts.

Steel Bridges in Philadelphia Designed for Permanent Artistic Effects. Recent practice in highway crossings over railroads. Steel is protected by concrete with architectural outlines and surface treatment. 6 ills., 2,500 words. Engineering Record, November 13. 10 cts.

Architectural Effects Secured in Glens Falls Arch Bridge Over Hudson River. Railings, curved brackets and a special spiral stairway are the features of a reinforced concrete bridge. 8 ills., 1,500 words. Engineering Record, November 6. 10 cts.

spiral stailway are the reinforced concrete bridge. 8 ills., 1,500 words. Engineering Record, November 6. 10 cts.
St. Louis Municipal Bridge East Approach Is a Steel Viaduct Nearly Three Miles Long. Economy results from the use of rolled I-beams and longitudinal girders as trolley rail stringers. Details of expansion joints. 3 ills., 1,000 words. Engineering Record, November 20. 10 cts.
Olympic Bridge, Island Park, Toronto. Description of the design and construction of a reinforced concrete arch bridge. By E. M. Proctor. 7 ills., 1,000 words. Canadian Engineer, November 25. 15 cts. Lift Spans Over Arkansas River Designed for Possible Shifting of Channel. Bridge near Pine Bluff, Ark., contains unusual lifting mechanism. Chains are used instead of cables. 6 ills., 3,000 (Continued on page 896.)

(Continued on page 896.)

### NEWS OF THE SOCIETIES

#### Calendar of Meetings.

Dec. 9, 10.—KANSAS GOOD ROADS ASSOCIATION and Kansas Good Roads Federation. Fifteenth annual conven-tion, Arkansas City, Kan. Dec. 10, 11.—OKLAHOMA GOOD ROADS ASSOCIATION: General conven-

tion, Tulsa, Okla.

Dec. 14-16—ROAD CONGRESS, Worcester, Mass. Herbert N. Davison, general secretary, Chamber of Commerce, Worcester, Mass.

Dec. 27-Jan. 8, 1916.—SECOND PAN-AMERICAN SCIENTIFIC CONGRESS.— Washington, D. C., Department of State, Washington.

Jan. 17-19, 1916—MONTANA INST TUTE OF MUNICIPAL ENGINEERS. Annual meeting, Billings, Mont. Secr tary and treasurer, C. C. Widener, Boz

Feb. 12-19, 1916.—NINTH CHICAGO CEMENT SHOW.—First Infantry Armory and Coliseum, Chicago, Ill. Secretary, Robert F. Hall, Cement Product Exhibition Co., 208 South LaSalle street.

Feb. 15-18, 1916.—SECOND NATIONAL CONFERENCE ON CONCRETE ROAD BUILDING.—Secretary, J. P. Beck, 208 S. LaSalle St., Chicago, Ill.

S. Lasalie St., Chicago, Ill.

Feb. 28-March 3, 1916.—AMERICAN
ROAD BUILDERS' ASSOCIATION. Thirteenth annual convention, including sixth
American Good Roads Congress and seventh National Goods Roads Show of Machinery and Materials, Pittsburgh, Pa.

May 8-10, 1916.—SOUTHWESTERN
WATER WORKS ASSOCIATION. Annual
convention, Waco, Tex. Secretary, E. L.
Fulkerson, Waco, Tex.

May 10-17. 1916.—NATIONAL CONFER

May 10-17, 1916.—NATIONAL CONFERENCE OF CHARITIES AND CORRECTIONS.—Annual conference, Indianapolis, Ind.

June 15, 16.—OHIO SOCIETY OF ME-CHANICAL, STEAM AND ELECTRICAL ENGINEERS. Convention, Cleveland, O. President, Joseph L. Skeldon, Toledo.

#### Lincoln Highway Association.

The annual meeting of the directors of the Lincoln Highway Association was held November 10 at the offices of the National Headquarters, Detroit, Mich. At the meeting important plans for the future development of the great national thoroughfare were formulated.

The members of the directorate include: Henry B. Joy, president of the Packard Motor Car Co., Detroit; Carl G. Fisher, president of the Prest-O-Lite Co., Indianapolis; Emory Clark, president of the First and Old Detroit National Bank, Detroit; Roy D. Chapin, president of the Hudson Motor Car Co., Detroit; F. A. Seiberling, president of the Goodyear Tire & Rubber Co., Akron; Russell A. Alger of Alger, Smith & Co., Detroit; Albert J. Beveridge of Indianapolis; A. Y. Gowen, vice-president of the Lehigh Portland Cement Co., Chicago; Paul H. Deming, vice-president of the American State Bank, Detroit; John N. Willys, president of the Willys-Overland Co., Toledo; and Austin F. Bement of Detroit.

Officers for the coming year were elected as follows: Henry B. Joy, president; Carl G. Fisher, first vicepresident; Roy D. Chapin, second vice-president; Emory W. Clark, treasurer, and Austin F. Bement, secretary.

The death of the late A. R. Pardington last July left the office of secretary vacant and since that time Mr. Bement has been acting in that capacity under

the executive committee of the directors. He now succeeds to the secretaryship and will be in charge of the affairs of the association.

Following the dispatch of routine business, the first act of the meeting was the passage of a resolution of thanks by the directors to the Lincoln highway consuls located along the route of the highway and to the national press and publications of the country for the material and consistent aid given in forwarding the Lincoln highway propaganda. The efforts of these men, coupled with the wide publicity given the Lincoln highway, have been among the biggest factors contributing to the phenomenal develop-

ment of the highway.

Of highest interest among the plans for the coming year will be the building of as large a number as possible of seedling miles along the route. These seedling miles, built according to specifications prescribed by the Lincoln Highway Association as a standard, and with cement donated by the association for their construction, are in high favor with every part of the route that has them. Petitions for additional cement for such construction have come to the association from the counties now possessing these seedling miles, but it has been found necessary to limit the donation to each to 3,000 barrels of cement, enough to build one mile, since the best results in furthering the complete building of the highway can be obtained by placing these donations in as many localities as possible where they will stand as an example for further building.

Five seedling miles have now been completed in Indiana, Illinois and Nebraska and the plans embrace the building of many more where the need of hard surfaced construction is most apparent.

The directors also endorsed the proposition of building a memorial section in honor of the late secretary of the association, A. R. Pardington, at some point between Salt Lake City and Reno, Nevada. Funds will be gathered for this purpose and a fitting tribute erected.

League of Texas Municipalities.

The third annual convention of the League of Texas Municipalities was held at Greenville, November 11 and 12. At the opening session, which was presided over by President Chapman, municipal ownership was discussed, Mayor Riggins of Waco, Charles Saville and A. C. McDonnell of Kansas City, J. J. Pastoriza of Houston and Mayor Marmion of Houston Heights taking part. At the afternoon session Prof. J. M. Bryant of Texas University read a paper by Dr. Herman G. James of Austin, who was prevented from attending by sickness, on "Legal Powers of Cities Under the Home Rule Enabling Act." Charles Saville of the Sanitation Department of Dallas, gave a lecture on city sanitation, disease prevention and mosquito extermination. An inspection trip was later made to Greenville's municipal plants, which are said to be the most successfully operated municipal plants in the state.

The formal address of welcome was delivered at the evening meeting by W. Walworth Harrison. Later A. C. McDonnell of Kansas City told of his trip over the United States and Europe studying sewage disposal plants. His address was illustrated by lantern slides.

At the Friday morning session Dr. B. F. Arnold of Greenville spoke on "City Sanitation." In his address he dwelt upon the necessity of compulsory medical examination of school children in order to prevent disease. A. D. Duck, city engineer of Greenville, spoke on street maintenance and the maintenance of earth roads. discussed the merits of street paving without the five-year maintenance guarantee. He also urged a compulsory examination of city engineers in order to determine their fitness to hold office. The feature of the afternoon session was the address on "Taxation" by J. J. Pastoriza.

Hillsboro was selected as the meeting place for the 1916 convention and following officers were elected: Mayor Ed. H. McCuistion, Paris, president; City Attorney E. J. McDonnel, Dallas, first vice-president; Mayor J. B. Marmion of Houston Heights, second vice-president; W. H. Knight of Hillsboro, third vice-president; Dr. Herman G. James of Austin, secretary and treas-

#### Massachusetts City and Town Planning Conference.

The third annual conference of the city and town planning boards of Massachusetts was held at Boston beginning November 12, and an exhibition was held during the opening of the new east wing of the state house from November 13-20. The display filled twelve rooms in the new wing.

Governor David I. Walsh made the opening address. He called for cooperation between cities and towns in the planning movement and emphasized the importance of city planning, by "Nothing in the whole probsaying: lem of government is of such supreme importance as the health of the community and for that reason the work of city planning boards ought to be encouraged."

Mayor Curley spoke on what has been done to prevent fires during his administration. He stated that in three years the loss by fire in Boston amounted to about \$800,000, and estimated that about \$400,000 was saved the city in the last year by fire prevention methods. He also praised the work of the city planners.

Other speakers included Patrick F. O'Keefe, vice-chairman of the Metropolitan Council of Fifty; John B. La-

throp, of the city bureau exhibit; Shelby M. Harrison, director of the Pittsburgh survey and of the department survey exhibits of the Russell Sage Foundation; Charles F. Gettemy, chairman of the homestead commission; Ralph Adams Cram, William H. Say-ward, of the Master Builders' Association; Louis C. Newhall, Dr. David Snedden, commissioner of education; George von L. Meyer and Robert A. Wood.

Among the exhibits were those of the Boston Transit Commission, Wire Commission, Health Department, and Park Commission, together with an exhibit by the Public Service Commission of the state showing the development of the railroad and interurban service; New York Civic Bureau for street planning; photographs from Cambridge; plans and color drawings from the Harvard University School of Landscape Architecture; and a city plan-ning scheme from Winthrop, with a description of the work of the Win-throp Planning Board. The town of Winchester showed a topographical profile map model of what the town has accomplished in the elimination of its grade crossings. Fall River showed land reclamation work which eliminated a nuisance. Poor and model tenements were compared by models. J. A. O'Keefe, fire prevention commissioner, presented a striking exhibit of his field of work in the Metropolitan District, showing the fire hazards he has found and showing how he has remedied them, together with what the householder and the manufacturer can do to abolish fire risks and what the school authorities must do to make the schools

Conference on Unemployment.

City officials from various parts of the state attended a conference on unemployment held at Albany, N. Y., November 18. The meeting was called by the committee on unemployment of the state mayors' conference. Ten experts addressed the gathering, which was held in the board of supervisors' room in the city hall.

Municipal lodging houses were advocated as one means of lessening unem-

All present agreed that there were four obstacles to overcome before the problem could be gotten at in such a way that it might be overcome. obstacles are: Short terms of office of city officials, the frequent changes in the personnel of city administrations, the charter provisions in most cities which prohibit or hamper planning and financing, and the relatively small amount of municipal improvements that can be prosecuted at that season of the year when unemployment is most acute.

Mayor J. Teller Schoolcraft, of Schenectady, presided. United States Commissioner of Immigration Frederick C. Howe expressed the belief that the country is just entering a period of long prosperity. He advocated a local labor exchange in each city to co-operate with federal and state exchanges

for a distribution of labor.

Municipal lodging houses were advocated by Charity Commissioner John A. Kingsbury, of New York City. He said that a study of the men who stopped at the New York municipal lodging houses last winter showed that only 19 per cent. could be regarded as absolutely unemployed. Over one-half were physically and mentally able and willing to work, while 18 per cent. were chronic vagrants or confirmed inebriates, and nine per cent. were temporarily incapacitated.

An expert study of the problem with a view to working out a plan which the municipalities could adopt in their own budgets was urged by Dr. N. I. Stone, of Brooklyn. He advocated regularization of public work with a national employment reserve to be operated in the same manner as a federal reserve bank does with the idle funds in periods

of stringency.

Director Dean, of the state education department, advocated vocational schools, control and regulation of municipal products and the possible establishment of state industries.

Other speakers were: Thomas D. Fitzgerald, of Albany, who presented organized labor's view of the problem; City Chamberlain Henry Bruere, of New York; John R. Shillady, director of the mayor's committee on unemployment in New York City; Mayor School-craft and Walter L. Sears, of New York City. Dr. John Andrews, of the American Association for Labor Legislation, was represented by Miss Elizabeth Hobbs.

In an open letter to the conference Fred C. Phoenix, of Albany, advised giving consideration to the cause and not the effects of unemployment. Some of the attempts made in the past to alleviate the trouble he termed silly.

Louisiana Good Roads Association.

The annual convention of the Louisiana Good Roads Association was held at Alexandria Oct. 29-30. The main subject of discussion was whether Louisiana shall build three big trunk line highways traversing the state by the proceeds of a three million dollar bond issue or shall adhere to the plans of the State Highway Commission and follow a system of building in all parishes simultaneously. A resolution was finally adopted in favor of the former project. The resolution will be submitted to the next Legislature and will ask for the issuing of three million dollars worth of five per cent bonds. Payment of these bonds is proposed to come from the one-quarter mill tax now assessed in addition to the revenue derived from the automobile tax.

State Highway Engineer Atkinson opposed the bond issue on the grounds that it would practically paralyze the working of his department. The highway one-quarter mill tax which brings in a revenue of \$140,000 a year and

#### MUNICIPAL INDEX

(Continued from Page 894.)

words. Engineering Record, November 27. 10 cts. Construction Details of Bridge Across Construction Details of Bridge Across
Portland Harbor. Concreting methods
on bridge described in previous issue.
Also details of foundation work using
concrete caissons floated to pier sites.
8 ills., 2,500 words. Engineering News,
November 4. 15 cts.

Also details of foundation work takes concrete caissons floated to pier sites. 8 ills., 2,500 words. Engineering News, November 4. 15 cts.

Double-Deck Bascule Bridge Over Chicago River. Description of the bridge, the construction of which involves specially interesting and difficult problems, since the elevated railway had to be kept in operation over the old swing bridge during the construction of the new bridge. By H. E. Young. 5 ills., 2,700 words. Engineering News, November 4. 15 cts.

Substructure of the Lake Street Bascule Bridge at Chicago. Describes foundation work on one of the heaviest draw bridges ever built, a double-deck, double-leaf bascule. Anchor piers in open wells. Steel sheet pile coffer-dam for main piers. By H. E. Young. 2 ills., 2,500 words. Engineering News, November 11. 15 cents.

Rebuilding Piers and Abutments on the Black River Bridge. A reinforced concrete ring was used to enlarge pier footings; abutments were set on concrete piles. By E. U. Smith. 7 ills., 700

words. Engineering News, November 25. 15 cents.

Bridges and Viaducts on the Multnomah County Section of the Columbia River Highway. Gives description and cost of the more important bridges along this road. 11 ills., 2,000 words. Good Roads, November 6. 10 cts.

#### MISCELLANEOUS.

Concrete:
Sand for Concrete and Cement Mortar Should Have "Jump" in Grading. The new view based on theoretical grounds and verified by test, runs counter to accepted theory that particles should be uniformly graded. The author shows that the best sizes includes particles between 4 and 10 screens and the finest passing the 40 screen. By Robt, H. McNeilly. 2 ills., 5,000 words. Engineering Record, November 27. 10 cts.

Effect of Temperature on the Attainment of Strength of Concrete. Describes and gives the results of experiments made at the Illinois Engineering Experiment Station. 6 ills., 1,500 words. Engineering and Contracting, November 24. 10 cts.

Influence of Temperature on the

Influence of Temperature on the Strength of Concrete. Results of tests on specimen cubes and cylinders and conclusions therefrom. By Prof. A. B. McDaniel, 2,000 words. Canadian Engineer, November 4. 15 cts.

Precautions Necessary to Assure Suc-

cessful Concrete Work in Winter. cusses heating concrete materials, construction of forms, protecting the concrete and standard building practice. 10 ills., 3,000 words. Concrete, November. 15 cts.

Miscellaneous:

Methods and Plant Employed in Constructing a Large Concrete-Lined Reservoir in California. Describes roof construction and concrete lining for oil reservoir. From a paper by E. D. Cole. 1 ill., 3,000 words. Engineering and Contracting, November 24. 10 cts.

Time and Motion Studies as Applied to Construction Work. The seventh of a series of articles showing how scientific management may be applied to construction work. The value of time and motion studies and their application is pointed out. By Daniel J. Hauer. 3,000 words. The Contractor, November 15.20 ets.

United States Will Capitalize Its Scenery. Government has yielded to pressure and new policies have been developed for dealing with the national parks. 4 ills., 1,200 words. Engineering Record, November 6, 10 cts.

Portland's Municipal Testing Laboratory. Used in connection with purchasing supplies and securing specified materials in public construction work; apparatus used and cost. By Haldane White. 3 ills., 1,250 words. Municipal Journal, November 25, 10 cts.

the automobile license which amounts to \$70,000 which the bond issue resolution proposes to be used in the payment of the proposed three-milliondollar bond issue, he declared, would leave him nothing to work with on other parishes throughout the state. He said he would prefer to work under the plans outlined by the state highway commissioner, which called for a division of the \$140,000 among the different parishes of the state.

P. M. Milner, president of the organization, and others replied to this. They declared this division gave each parish practically nothing to work with, the sum each would receive being only

about \$2,000.

"We cannot have the great good roads development we wish unless we get these big trunk line highways established first and in this way draw the great tourist travel to the state," said Mr. Milner. "Conservative estimates have placed the number of such tourists who would visit Louisiana at not less than 50,000 a year, while they would spend at least one million dollars a year in the state. With the trunk highways built, the parishes would have something to build to and it would be but a short while until every parish would be connected by laterals with these trunk roads. I take exception to Mr. Atkinson's belief that the bond issue would paralyze the work of his department as he would have these trunk highways to build while there would also be something left to do work in each parish.

"We now have a one-quarter mill good roads tax, realizing about \$140,000 a year. The licensing of automobiles exceeds \$50,000 and will yearly increase in a large way. This makes over \$200,000 a year. Let us fund these two resources or capitalize them and issue \$3,000,000 of bonds, bearing five per cent interest, paying off one bond of \$50,000 every year. The expenditure properly, wisely and economically of this money in the building of good main highways in this state, without further taxation, would put this money back into the pockets of the people in ten years, in the saving in wear and tear on equipment and stock, in increased land values, increased efficiency in marketing products, not to mention the moral, social and educational improvement, which would be incalculable.

"Let Louisiana be one of the lead-ers in state bond issues. This does not mean to stop your road district bonds. My plan simply changes the method of using the money which we are now annually spending. The only way to get main state highways is by a state bond issue. Very few of the states have state bond issues, but all are coming to it. They all are, however, spending millions annually on good roads.

"North Carolina has issued \$8,600,000 in the last five years: California in 1910 voted \$18,000,000, besides the \$15,-000,000 of county bond issues. Massachusetts has spent \$10,000,000, besides spending \$1,000,000 a year, and only last year appropriated \$2,500,000 to be spent in the next four years in certain localities. The little state of Rhode Island, with 2,121 miles of roads, has spent \$600,000 since 1912. Kentucky in the last two or three years has voted \$2,375,000 bond issues. Virginia since 1906 has voted \$7,101,000 of bonds, besides appropriating from its revenues \$2,300,000. Tennessee has voted since 1910-1914 \$12,474,298 and in 1915 \$5,500.000."

The convention also adopted a resolution endorsing a \$25,000,000 appropriation by the national government for the building of highways in the United States on condition that the states subscribe an equal amount to their proportionate allotment of this

President P. M. Milner and Secretary William Polk were re-elected unanimously. L. E. French was elected assistant secretary. The association also amended the charter so that in addition to the honorary board of directors a working board of ten men from the state at large be appointed to work with the officers of the association during the year. Shreveport was selected for the 1916 convention city.

Pennsylvania Welfare, Efficiency and Engineering Congress.

The third annual Welfare, Efficiency and Engineering Congress was held at Harrisburg, Pa., November 15-18. Among the speakers at the first session were Governor Brumbaugh, R. J. Cunningham, state highway commissioner, and Dr. Nathan C. Schaeffer, superintendent of public instruction.

The addresses at the morning session of the second day attracted much attention, as Dr. W. T. Hornaday, curator of the Bronx Zoo, and Irvin C. Williams, deputy commissioner of forestry, called attention to the importance of conservation of the wild life and the

(Continued on page 899.)

#### **PERSONALS**

Pollock, C. D., has been appointed by the Brooklyn Engineers' Club as delegate to the Second Pan-American Scientific Congress, which will be held at Washington, D. C., December 28-Jan. 8.

Collier, Henry Latimer, has opened an office as consulting and constructing engineer in the Candler Building, Atlanta, Ga. His specialties are street and highway pavements and ferro-concrete construction-plans, specifications and supervision; also the location of disputed land lines and boundaries. Mr. Collier is a graduate civil engineer of the University of Georgia, 1872. He has had nineteen years of practical experience in the location, construction, maintenance and operation of railroads; three years in general contracting; ten years as commissioner of public works of Atlanta. He served for five years as a member of the "College of Examiners of Surveys" in the Interior Department, U. S. Government. For the past four years he has been consulting engineer of the Yellow Pine Manufacturers' Association, during which time he made a thorough study of pavements in this country and Canada.

Veit, Bernard, mayor-elect of Erie, Pa., died at that city November 30, aged 47. He had been ill since election day, following a hard campaign.

Officials have been elected as fol-

Everett, Wash.-W. H. Clay, mayor; T. J. Kelly, commissioner of Public Safety; Dennis D. Merrill, commissioner of Public Works.

Brunswick, Ga.-George, H. Cook, J. B. Abrams, George C. Smith and B. F. Jones, aldermen.

Venus, Tex.—J. P. Jones, mayor, to fill the unexpired term of W. T. Groom, deceased:

Lawty, Fla.—F. F. Goodwin, mayor; W. Brown and Charles Dinkins, councilmen; L. H. Hill, clerk and treas-

Bradford, Pa.-H. H. North, mayor; commissioners: G. P. Boothe, Accounts and Finances; J. G. McCutcheon, Public Safety; H. E. Allen, Streets and Public Improvements; W. L. Currie, Parks and Public Property.

West Asheville, N. C.—J. L. Crook, mayor; H. E. Hames, Bert Ingle, W. R. Carter, C. M. Johnson and J. G. Anderson, aldermen.

Urbana, O.-Harry E. Rock, Service Director; William E. Schief, Safety Director.

The following have been elected in Utah:

Mammoth-Mayor, Hugh J. Jameson; treasurer, Mrs. M. Boone; councilman, four-year term, John councilmen, two-year term, William Fanger, J. Steegman, F. Simmons.

Monticello-Nephi Bailey, mayor; A. F. Wood, Joseph Innes, J. Edward Rogerson and John H. Jones, trustees. Copperton-Mayor, R. G. Hunt; trustees, R. J. Smith, Gorge Pope, P. Barnett, A. T. Miller.

Pleasant Grove-Mayor, S. L. Swenson; recorder, Joseph Hilton; treasurer, Mrs. Marie Smith; four-year councilman, A. H. Oltin; two-year council-men, J. L. Harvey, W. H. Marrott, Mark Bezzant, D. M. Smith.

Lehi-Mayor, W. S. Gurney; four-year councilman, Joseph Bradbent; two-year councilmen, F. A. Child, Sidney Gilchrist, J. W. Wing, Jr.; recorder, A. L. Yates; treasurer, Herbert Taylor.

Murray-Mayor, J. W. McHenry; commissioner, Charles Caldwell; auditor. S. M. Mumford.

Springville-Mayor, Harold Alle-man; recorder, J. L. Whiting; treasurer, Mary Thorn; four-year council-man, J. L. Phillips; two-year councilman, Moses Childs, I. E. Clegg, F. M. Hartman.

Payson-Mayor, Thomas E. Reece; recorder, A. L. Wilson; treasurer, Elizabeth A. Crook; four-year councilmen, Jone Bone; two-year councilmen, Thomas L. Wilson, Jacob Snyder, W. H. Shermer.

\_\_\_\_\_\_\_

# NEW APPLIANCES

\_\_\_\_\_\_

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

# STREET LIGHTING FIXTURES For Mazda Lamps, Multiple and Series.

Street lighting is generaly accomplished by one of two methods, assuming that conditions require an average mounting of 15 to 18 feet. Low candlepower lamps may be used with comparatively close spacing, or higher candle-power lamps with a wider spacing. For the first class, which includes installations of 40, 60, 80 or 100 c.p. mazda series lamps, the concentric reflector for spacings of 150 feet or less is best, and the radial for greater spacings, the prismatic being an alternative for extreme spacings. For the second class, utilizing 250 or 400 c.p. lamps, concentric reflectors are recommended for spacings of less than 200 feet and the prismatic refractor for all greater spacings.

The concentric reflector gives a fair amount of light at the higher angles with more light toward the vertical, and is adapted to close spacings. The radial wave reflector gives its maximum light at the 10 degree angle, with a fair amount under the lamp and tends toward uniform intensities from one lamp to the other, even at comparatively wide spacings. The prismatic refractor produces the same results as the radial wave reflector except in a more marked degree, giving most of its light at the 10 degree angle. It is particularly adapted for extreme spacings.

The position of the filament in relation to the reflecting surface is most important. If the filament is too far from the reflector more light is thrown directly under the lamp, less light is projected at the angles best suited for street illumination, and a considerable portion of light is thrown above the horizontal where it is useless and annoying. If the filament is too close to the reflector, more light is absorbed and the spherical efficiency of the unit is seriously reduced without improving the distribution. In General Electric units these relations have been carefully worked out to give the most efficient results.

The insulation in these fixtures is designed primarily for safety. The

designed primarily for safety. The

HORIZONTAL AIR COMPRESSOR. Single Cylinder, Steam Actuated.

main insulator will, it is claimed, withstand voltage strains up to 25,000 volts and interposes a maximum insulation between current-carrying parts. It has great mechanical strength because it is composed of only one massive porcelain, this design eliminating the use of a number of small insulators. The highest grade of dry porcelain with a heavily glazed surface of high dielectric strength is used. The insulator also acts as a spreader arm for the leads.

The brackets and fixtures are simple and unobtrusive in appearance but have artistic lines, and the wide range of designs allows a selection to harmonize with the thoroughfare to be lighted. The designs include the "bishop's crook," the "double bend," "right angle bend," "right angle bend," "right angle joint," and the plain or ornamental "goose neck." Petticoat insulators may be had. The types of center span fixtures include eye suspension with or without cross arm insulator, strain insulator suspension, and cross arm suspension.

The cuts on the next page show the double bend, 1¼-inch pipe series bracket; the bishop's crook 1¼-inch pipe multiple bracket; the eye suspension, cross arm insulator hanger, multiple fixture; the eye suspension multiple fixture, and also a cross section of hood and insulator for series bracket showing external wiring. These brackets and fixtures are made by the General Electric Company, Schenectady, N. Y.

# HORIZONTAL AIR COMPRESSORS High Speed Machines—Various Drives and Sizes.

The Gardner horizontal air compressor is a high speed unit made in single or double cylinder types, both power driven and steam actuated. High speeds are made possible by the self-oiling system and with the high speed in a machine of same diameter and stroke dimensions as in the open-frame type heretofore offered, the capacities are one-third greater. Among other uses these compressors have been found especially suited for deep well pumping.

The main frame is of the inclosed type and of massive proportions designed for stiffness and rigidity at maximum load. The hood and side covers which enclose the frame for the splash lubrication

system can be removed to permit easy access to bearings, cross-heads, etc. The bearings are completely housed with an oil pocket for catching the oil and draining it back to the frame basin. In the steam-actuated type the center connection between the cylinders is open, so that the stuffing-boxes in the cylinder heads can be easily adjusted.

The water jacket is combined in the same casting with the cylinder about which the valves are set radially. This allows water circulation about the cylinder walls and through both heads, thus cooling the parts where the heat of compression is greatest. The piston is double-acting, with cast-iron spring rings accurately machined and ground to a perfect joint. The air piston travels from ½ inch to ¼ inch of the head, varying with the size of the machine, so that the clearance is reduced and volumetric efficiency assured.

The crankshaft is an especially large and strong steel forging. It is correctly counterbalanced to insure smooth running at all speeds. The connecting-rod has bronze boxes on both ends, giving good wearing surfaces, and is provided with a take-up arrangement permitting of easy and sensitive adjustment. The flywheels are very heavy and properly proportioned for high and low speeds and keyed on the shaft.

The discharge valves are cup-shaped, of steel, poppet type, light and durable. The inlet valve is a ground steel disc, light, and seating quietly and so arranged that it cannot be drawn into the cylinder. The valve and seat make a self-contained unit.

All bearings are oiled by the splash system from the main basin which is beneath the cranks. At each revolution the cranks dip into the oil, splashing it copiously to the main bearings, crosshead guides, pins and piston rods. The air cylinder is provided with an automatic sight-feed oiler, while the steam cylinder is lubricated by a mechanically operating pump. The entire lubrication in the machine is therefore automatic.

On steam machines a simple crank arrangement is provided for driving the steam valve and the necessity of a large-diameter eccentric is obviated. The rocker-shaft is of large diameter and extends entirely through the main frame. It is reversible, an advantage when the side supporting it wears down.

The steam cylinder is made thick enough to permit of reboring. The steam valve is a simple, plain slide type. The steam piston has cast-iron expansion rings, ground to a perfect joint. The 12-inch cylinder is equipped with the Meyer valve gear, an appliance for facilitating steam economy by permitting an early cut-off to suit exact conditions.

The compressor may be obtained for belt, gear or silent chain drive, or it may be a self-contained, steam-actuated unit. The single cylinder is made in capacities ranging from 108 to 558 cubic feet per minute, the steam-actuated machine ranging from 29 to 558. Both types of duplex compressor have capacities varying from 436 to 976 cubic feet per minute.

The accompanying illustration shows a steam-actuated class S-S single-cylinder machine. The compressors described are made by the Gardner Governor Company, Quincy, Ill.

#### INDUSTRIAL NEWS

Cast-Iron Pipe.-Chicago-Municipal lettings for the near future include 500 tons at Mishawaka, Ind., 700 tons at Sheboygan, Wis., and 800 tons at Dayton, O. Other smaller jobs are reported. Quotations: 4 inch. ported. Quotations: 4-inch, \$29; 6-inch and up, \$27; Class A, \$1 extra. Birmingham—Local pipe manufacturers consider that this is going to be the heaviest winter in many years. Inquiry is very active and the volume of new business received is most satisfactory. Steady operation for some time is assured and the usually dull season promises to reverse itself. Quotations: 4inch, \$23.50; 6-inch and up, \$21.50. San Francisco—Municipal business continues quiet. The city of Santa Cruz ordered a carload November 16 and Pasadena was in the market November 30 for a small lot. Aberdeen, Wash., took bids December 8 for 4,000 feet of 6-inch Class C pipe. Quotations: 6-inch and up, \$33; 4-inch, \$35; Class A, \$1 extra. New York-Providence, R. I., opened bids December 6 for 612 tons of 4, 6, 8 and 12-inch pipe. No other municipal lettings were reported. Prices continue strong. Quotations: 6-inch, Class B and heavier, \$27; Class A, \$28.

Lead.—Lead is strong but less active. Quotations: New York, 5.25 cents; St. Louis, 5.20.

The Kissel Motor Car Company, Hartford, Wis., in its new line of seven chassis sizes of commercial vehicles for 1916, announces a new ¾ to 1-ton worm-drive truck for \$1,250. The company also announces the establishing of the following new agencies: Phillips Street Garage, Methuen, Mass.; L. E. Gibson, Georgetown, Ga.; S. W. Marcus, Baltimore, Md.; Horat & Kohler, Springfield, Mo.; Henderson-Rowe Auto Co., Washington, D. C.; Dallman-Cooper Supply Co., Fond du Lac, Wis.; Collins Brothers, Fresno, Cal.; Stuart P. Warner, Lynn, Mass.; Monumental Motor Car Co., Baltimore, Md.; P. M.

Cloud, Earlville, Iowa; Julius Kohl, North Liberty, Iowa; Joseph Fluxman, McMahon, Paris, France.

Yeomans Brothers Company, 231 Institute Place, Chicago, Ill., announces that by a special agreement with the Shone Company of Chicago it has taken charge of the sale and installation of the Shone pneumatic sewage ejector throughout the United States and Canada. The ejector, together with centrifugal ejectors and lines of pumping machinery, will now be sold from the Chicago office and through its established agencies and those of the Shone Company.

The Harrison Safety Boiler Works, 17th street and Allegheny avenue, Philadelphia, Pa., has just published a handsomely gotten-up book devoted to the use of Cochrane meters, entitled "Finding and Stopping Waste in Modern Boiler Rooms." The value of feed water and condensate meters as aids in the management of power plants is taken up in detail in the introductory part of the book, covering all factors and conditions. With a feed water meter installed, it becomes possible to measure the effect of changes in connection with these several factors, the over-all efficiency and economy, and the means and ways of obtaining the desired result can be determined. With facilities for continuous quantitative measurements and records as afforded by this apparatus, scientific management becomes possible and natural, and standard rules of operation, such as directions for handling fires, regulation of draft, blowing of soot, banking of fires, carrying overloads, etc., can be formulated. In the subsequent sections of the book, the Cochrane Metering heater (combined open feed water heater and hot water meter) with its several modifications, is described in detail, as also the Cochrane flow recorder for use in connection with V-notch weirs. In the last pages of the book a new type of meter, working on the volumetric principle by means of which it is possible to obtain accuracy as great as within 1/3 of 1% is described.

#### NEWS OF THE SOCIETIES

(Continued from page 897.)

woodlands so that the Pennsylvanians of the future may enjoy them. Both urger the city dweller to join hands with the farmer to protect nature.

The Workmen's Compensation Board held a series of symposiums on compensation, at which volleys of questions were fired and the state officials encouraged asking for information with the idea of getting together. These informal meetings were declared the most important of the conference.

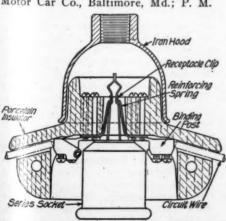
Commissioner John Price Jackson also went into the subject at the morning session, in which he said charges that politics would mix in the state insurance fund were "bosh" and that the fund was going to be administered by the state for the state. Dr. Jackson also insisted that the compensation system and child labor laws were so thoroughly grounded in public sentiment that they would not be repealed, but improved.

He praised the child labor law and predicted an eight-hour day for minor labor.

Persons who do not take proper precautions to prevent fires and on whose premises blazes occur should be held individually responsible, declared Charles H. Wolfe, chief deputy fire marshal, in the closing address of the second day.

"Individual responsibility for loss by fire seems drastic in its operation to the ordinary citizen, but such restraint must be enforced if the number of fires is to be reduced," declared Mr. Wolfe.

The final sessions were given over to a discussion of many phases of the state government. George S. Webster, chief of the Bureau of Surveys of Philadelphia, made the recommendation that Governor Brumbaugh appoint an engineer of broad and liberal ideas to the vacancy on the Public Service Commission. He outlined the duties of the







Eye Suspension, Cross Arm Insulator Hanger.

Cross Section, Hood and Insulator, Double Bend Bracket, Hang GENERAL ELECTRIC STREET LIGHTING BRACKETS AND CENTER SPAN FIXTURES.

commission in making his suggestion.

Chairmen of the conference were F. Herbert Snow, chief of the Bureau of Engineering, Public Service Commission; R. J. Cunningham, State Highway Commissioner, and E. J. Stackpole.

Dr. Robert Sackett, dean of Pennsylvania State College, made a plea for the better teaching of industrial branches in schools and colleges and outlined what Germany has done along this line. Industrial education, he pointed out, is one of the most needed things of the day.

Continuation schools, such as are planned by the state for working children between the ages of 14 and 16 years, will do much to give workers an education, he said.

Road Improvement Conference.

A road improvement conference will be held at Sedalia, Mo., December 11, to discuss subjects of interest to good roads men. The questions to be brought up are: "Shall we initiate a constitutional amendment to create a real state road fund?" and "How can we most effectively center such pressure on Congress as will secure prompt and substantial Federal aid for permanent road construction?" Among the speakers present will be J. C. Wonders of the United States Office of Public Roads and State Highway Commissioner F. W. Buffum.

Conference of Sewage Disposal Plant Operators.

Twenty-eight sewage disposal plant operators, besides a large number of visitors, attended a conference at Iowa State College, at Ames, November 2 and 3, held for the purpose of discussing more efficient methods of sewage disposal plant operation. The meeting, which was the first of its kind in the state, was under the supervision of Dean A. Marston, of the engineering department of the college.

Langdon Pearse, engineer in charge of the sewage disposal investigation in Chicago, spoke Tuesday night on the Chicago sewage disposal problem. Dean Marston, Lafayette Higgins, state sanitary engineeer, and C. S. Nichols and M. I. Evinger, of the college, also gave

addresses.

"The attitude of the average city council in towns about the state is that they have to install a sewage disposal plant else the town further down the line will object. The plant is duly built and left to run itself. A sewage disposal plant can no more take care of itself than a pump," said Dean Marston in his address.

"One town in the state spent \$6,000 for plant repairs and results were not worth 6,000 cents, whereas the same amount expended on efficient operation would have kept it in good condition. What we need is more good efficient

operators."

A round-table discussion of individual plant problems followed. Wednesday the operators were taken by auto to inspect four sewage disposal plants in and about Ames.

#### Oklahoma Good Roads Federation.

The annual convention of the Oklahoma Good Roads Federation will be held in Tulsa on December 10 and 11. Arrangements for the meeting are being made by the Tulsa Chamber of Commerce.

## Pennsylvania State Railways Associa-

Officials of street railways throughout the state will meet in Scranton on December 14 and 15 at the semi-annual meeting of the Pennsylvania State Railways Association. Besides practical car men, there will be many electrical experts in attendance.

Ohio Electric Light Association.

A convention of the Ohio Electric Light Association was held at Middletown, O., November 17. The meeting opened with an address of welcome by J. C. Anderson, vice-president of the Ohio Electric Light Association and general manager of the Middletown Gas and Electric Company. W. A. Wadsworth, commercial department of the Union Gas and Electric Company, of Cincinnati, gave an interesting paper on "Electrical Advertising." A paper, entitled "Power Sales Problems, read by H. J. Kunz, of the new business department of the Toledo Railways and Light Company of Toledo. At the afternoon session a paper, "Increasing Small Motor Loads on Central Station Circuits," was delivered by F. S. Dellenbaugh, Jr., of the small motor di-vision of the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa. The meeting closed with a visit to the plant of the American Rolling Mills Company.

Missouri Central Highway Association.

The Missouri Central Highway Association was organized at a meeting held at Brookfield, November 28, when the following officers were elected:

President, George W. Bailey; secretary-treasurer, F. R. Halliburton; assistant secretary, C. H. Jones, all of Brookfield. Vice-presidents were elected as follows: W. L. Cornett, of Linneus; J. R. Allen, Chula; J. O. McKinney, New Boston; J. E. Spencer, Shelby, and C. K. Hart, Brookfield.

#### New York State Automobile Association.

The fifth annual convention of this association was held at Binghamton, N. Y., November 17-18.

Secretary of State Hugo, in his address before the association, said in part:

"Motorists would be well-advised if they could more appreciably understand that public opinion has been hardening considerably of late against the motor car driver who operates it under conditions and at a speed which is not in accordance with a consideration that ought to exist amongst all users of the public highways. They would also be well-advised if they recognized how public opinion is moving and not further provoke the state and local authorities to go to the extreme

length 'anti-motorists' have often advised them to go, which these authorities would be very reluctant to follow."

Other speakers were Edwin R. Weeks, A. J. Deer, State Commissioner of Highways Edwin Duffy, M. S. Bane, Willis D. Sweet and Peter G. Ten Eyck. During the course of his remarks, Mr. Duffy said:

"I am endeavoring to impress upon every county in the state the great necessity of seeing that the greatest good to the greatest number shall be derived from the expenditure of highway money now remaining in the State Treasury. I do not feel that the second bond issue of \$50,000,000 will be the last. Road building in the state of New York will go on. The present idea of the highway commission is not to ask for a large appropriation from the legislature next year."

Frank M. Baucus, of Troy, was elected president; Herbert G. Andrews, of Brooklyn, first vice-president; Dr. S. W. Thompson, of Owego, second vice-president; Peter G. Ten Eyck, of Albany, third vice-president; H. W. Baker, Albany, secretary, and Fay C. Parsons, of Cortland, treasurer.

S. C. Tallman, of Auburn; E. B. Ellthorp, of Watertown, and H. A. Webb, of Medina, were selected as directors at large, and J. A. Gildersleeve, of Poughkeepsie, as member at large of the executive committee.

Philadelphia Engineer's Club.

Philadelphia's Engineers' Club has become the largest club of its kind in the United States, and in the entire world is only exceeded in point of numbers by the Engineers' Club of London, England. A total of 1,672 new members was obtained in the four-day campaign recently instituted, and the total membership of the club was brought up to 2,223. The Engineers' Club of New York, which has a membership of 2100 members, was previously the largest in America.

Cleveland Engineering Society.

A regular meeting of the society was held in the Chamber of Commerce Building November 9, at which E. H. Whitlock and A. J. Himes presented papers on "The Future of the Engineering Profession," discussing, also, the inter-relations of engineering and technical societies. A special meeting was held November 23. William H. Alexander, Local Forecaster of the Weather Bureau, gave a paper on "What the United States Weather Bureau Is Doing for the Benefit of the Engineer."

Chicago Section, American Association of Engineers.

At a meeting held November 5, bylaws were adopted for the Chicago section of this society. One hundred and sixty members attended the meeting. Sections are also being formed at Springfield, Ill., Minneapolis and Indianapolis.

#### ADVANCED INFORMATION BIDS ASKED FOR

#### CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

#### BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
	, .		REETS AND ROADS	
O., Independ O., Wash. O Miss., Bolto Minn., St. P Tex., Houst Cal., Pasade Tex., El Pas Ala., Bay M Ind., South	denceNoon, Court House n	Dec. 11. Constructing states. 11. Paving with hat Dec. 13. Constructing 5 Dec. 13. Grading and in Dec. 13. 5,000 cu. yds. o. Dec. 13. Paving with m. Dec. 13. Paving and sur Dec. 14. Grading, draint Dec. 14. Grading, paving	dewalks rd surface material, cost \$20,000. miles gravel road mproving streets. f shell for road work acadam facing roads. ng and surfacing several roads. f, curbing and constructing sidewalk.	A. J. Goudy, Vil. Clk. Ray Maddock, Clk. Dir. P. S. C. M. Farr, Secy. Hwy. Comrs. August Hohenstein, P. A. H. L. Washburn, Co. Aud. R. V. Orbison, City Engr. R. D. Barnum, Co. Aud. County Comrs. Veronica Sweeney, Clk., Bd.
Mich., Kalar Ind., Michiga Tenn., Know O., Hamilto Miss., Stark	mazoo10 a.m., an City xvilleNoon, on10 a.m., xville	Dec. 14. Resurfacing ros Dec. 14. Paving with br Dec. 15. Constructing 2 Dec. 15. Repairing and i Dec. 15. Placing 4,282 to	ds ick on two streets miles of first-class pavement mproving road ns of Novaculite, 5,315 ft. curb and gutter.	County Clerk. Bd. of Pub. Wks. Knox Co. Good Rds. Com. W. W. Crawford, Clk. Co. Com.
Ind., Angola Fla., Miami O., Cincinna	1:30 p.m., itiNoon,	Dec. 15 Laying 18,000 y .Dec. 16 Treating streets Dec. 17 Widening roads	ds. pavement with liquid asphalt	Roy Hirst, City Clk. City Clerk. Albert Reinhardt, Clk. Co. Commrs.
Ind., LaPort Cal., Sawtel Wash., Pros Wash., Olym Minn., Minn Mo., Kansas Wash Seat Fla., West Pt Ala., Opelik	e	Dec. 18. Constructing co Dec. 20. Grading, macade Dec. 20. Improving 11.5. Dec. 20. Constructing 35 Dec. 20. One gas. 7d. bld, Dec. 21. Furnishing abo Dec. 21. Constructing pa Dec. 27. Grad., drain. & a	oncrete sidewalks  mizing and constructing concrete curbs  miles state highway  miles of road, cost \$121,000  g. truck, 4-yd. cap. with 20-in. steel tires.  ut 1,000 tons asphaltic cement  ermanent highway No. 18  rd surface road  surfacing with sand clay, cost \$11,158	W. F. Krueger, City Clk.
Ala., Monro N. D., Manda Tenn., Mayna Ind., Anders Mich., Sault Ind., Portlai New Zealan Kan., Atchis	evillenoon, onste Marie3 p.m., ndd, Dunedin	Dec. 27. Grading, draining. Jan. 1. Installing drain estimated co. Jan. 3. Grading and ma. Jan. 8. Improving 2.75 Jan. 13. Constructing ab. Feb. 1. Constructing served. 9. 48,000 sq. yds. w. Mar. 1. Paving several served.	ng and graveling age system and paving several streets, ts \$216,000 .cadamizing several roads miles road out 24½ miles of macadam roads yeral roads ood block, rock asphalt or asphalt paving. streets	P. W. Turner, Co. Engr.  Black & Griffin, Engrs. G. N. Taylor, Ch. Co. Comr. County Comrs. H. L. Parsille, Co. Clk. J. M. Boniface, Co. Aud. Town Clerk. V. L. King, City Clerk.
Ind., Ridgev. Minn., Belle Ind., Wabasi Minn., St. Pi Mass., Bosto Cex., Ft. S. 1 D., Cincinnat D., Cuyahoga Ariz., Phoen O., Geneva Neb., Fremo Minn., Bemid a., Hamptor Mass., Cherr Minn., Mank: D., E. Palest a., Strawbei	ille 11 a.m., Plaine 8 p.m., h 6 p.m., aul 10.80 a.m., n Noon, Houston .11 a.m., il noon, if alls ix 2 p.m., iii 10 a.m., n 7:30 p.m., n Noon, yvale ato 2 p.m., ryvale ato 2 p.m., n Noon, yvale ato 2 p.m., n Noon,	Dec. 11 Constructing dr. Dec. 13 Constructing san Dec. 13 Constructing san Dec. 13 Constructing ser Dec. 13 Constructing ser Dec. 14 Constructing pip Dec. 14 Constructing ser Dec. 14 Constructing ser Dec. 14 Constructing ser Dec. 15 Constructing ser Dec. 15 Constructing ser Dec. 15 Constructing dra Dec. 15 Constructing dra Dec. 15 Constructing Da Dec. 16 Constructing Da Dec. 16 Constructing Da Dec. 16 Sewer construct Dec. 18 Constructing ille Dec. 20 Sanitary sewer ser Dec. 21 Constructing ser Dec. 21 Constructing ser	ainage ditch	W. J. Vaughn, Supt. of Const. J. E. Townsend, City Clk. W. L. Agan, City Clerk. August Hohenstein Pur. Agt. E. F. Murphy, Comr. P. W. Const. Quartermaster Philip Fosdick, Dir. P. S. W. F. Williston. City Clk. L. G. Knipe, Engr. M. C. Goddard, City Engr. John O'Connor, Co. Clk. W. M. Everts, Engr. P. A. Van Pelt, City Clk. E. F. Murphy, Comr. P. W. M. Hartel, City Clerk C. L. Kennedy, Co. Aud. O. L. Butts, Village Clk. J. Schofield, Town Clerk
Va Roanoko O Cheviot W. Va., Kene	eNoon, Noon,	Dec. 21. Constructing set Dec. 22. Constructing set Dec. 23. Constructing set	vers. wers in streetswer system	F. L. Gibboney, City Eng. A. J. Reusing, Cik. Oliver & Maupin, Engineers, Huntington.
Minn., Pine of Ind., Hartford. Clevelan Nob., Wausa Fla., Key Weisa., Mason Cida., Nyssa	City1 p.m., d City2 p.m., d	Dec. 23. Digging and con Dec. 28. Drainage ditch and 2,320 ft. 1 Dec. 29. Constructing drs Jan. 1. Sewer system an Jan. 4. Constructing sto Jan. 6. 1,000,000-gal. Im Jan. 10. Reclaiming and	wer system and disposal plant to cost  vers.  wers in streets.  wer system  structing ditch, cost \$10,000  work. including 25,000 yds. excavation  14 and 18-in. tile  illage ditch  d disposal plant, estimated cost \$12,000  rm sewer with catch basins. etc  hoff type sewage disposal plant  draining 8,000 acres of land	W. H. Hamlin, Co. Aud. F. P. Wallace, Drainage Comr. E. G. Krause, Clk. Co. Comrs. City Clerk. Harold Pinder, Clk. Bd. P. W. F. P. Wilson, City Engr. G. McGee, Chief Engr., Caldwell.
			VATER SUPPLY	

#### BIDS ASKED FOR

STATE CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Miss., Clarksdale	ec. 14 Water works pun ec. 14 Const. 4,000,000-ga ec. 14 Constructing wat ec. 14 Driving 3 10-in. v ec. 15 Furnishing and sa	nps and materials	M. W. Purnell, Clk. t. Hector Catieux, City EngrW. L. Wentz, Vil. ClkS. D. Nelson, Supt. W. W William Williams, Comr. W.
III., Elmnurst7.30 p.m., De	and furnishing	rvoir, pumping station, tower and ta 8 electrically driven numbs, 200 to 5	nk
Man., WinnipegNoon, De	ec. 15 Bronze castings,	brass piping, etc	ber of Com. Bldg., Chicago F. H. Reynolds, Ch. Comrs.
Mich Albion 5 nm De	o 15 Constructing num	ning station and holler house	City Clerk
Ida., Boise10 a.m., De Fla., LakelandDe	ec. 15 Drilling two 8-in.	wellsvater and electric system	Co., Kansas City. J. H. Smith, State Engr. J. R. Boulware, Secy. Bond
Wis., KenoshaDe Ark., BeebeJa	c. 20 Pump. sta, & filtra	tion plant, to cost about \$250,000 cost \$15,000anical gravity filter plant	Trus.  Board of Water Comrs.  City Clerk.  Hegger Cadieny City Engr
	LIGHT	ING AND POWER	
Ill., Cicero8:30 p.m., De	c. 13 Engine and gener	ator for high school addition	A. H. Burgess, Sec. Bd. of Ed.
Pa., Lebanon       8 p.m., De         Miss., Clarksdale       De         Il., Decatur       De         Fla., Lakeland       De	c. 13 Furnishing 60 ince c. 14 Power plant equ c. 15 38 ornamental 3-li c. 17 Additions to fire,	indescent and 17 arc lights	G. & E. J. R. Fertig, Chief Burgess M. W. Purnell, Clk. P. T. Hicks, City Engr. J. R. Boulware, Secy. Bond Trus.
O., Springfield1 p.m., De Md., EastonDe	c. 30 Boilers and piping c. 30 15 miles of electr c. 31 Furn. 600 arc light	street lighting	R. D. Dripps, Dir. Pub. Safety R. C. Gotwald, Arch Newton Electric Co J. W. Flenniken, St. Comr. n Bureau of Yards & Docks,
W. Va., WheelingJan	a. 6 Const. fireproof por	wer house at Dam 14, Ohio River	Washington, D. C. U. S. Engineer
O-1 7 1 1 0	FIR	B EQUIPMENT	
Cal., Los Angeles9 p.m., Dec Cal., Los Angeles10:30 a.m., Dec Fla., Lakeland10 a.m., De	c. 15Furnishing fire ho c. 15Furnishing sprinkl c. 17Quadruple combina	se. ler systemtion motor fire truck	C. L. Wilde, City Clerk Homer Hamlin, Harbor Engr J. R. Boulware, Secy., Bond
N. J., East Orange De Wis., Racine 8 p.m., De	c. 21One pumping engi c. 21One motor-driven chemical tank	necombination chem. & hose with 35-gr	Fire Commissioners,
D. C., WashingtonMan			Quartermaster General
		BRIDGES	
Cal., Ventura.       Determination         Pa., Phoenixville       Determination         Pa., St. Clairsville       1 p.m., Determination         D., St. Clairsville       1 p.m., Determination         Cal., Modesto       10 a.m., Determination         Pa., Camptown       Determination         Pa., Camptown       Determination         Pa., Philadelphia       Determination         Ariz., Tempe       2 p.m., Determination         Mo., Warsaw       Dec         Pa., Sunbury       Dec	11. Constructing reint 11. Reinforced concrete 13. Furnishing steel fo 13. Constructing reinfo 13. Constructing three 14. Const. two bridges 14. Wooden bridge ove 14. 180-ft, span bridge 14. Bridge construction 14. Steel & conc. bridge 14. 118-ft. span steel i 14. 175-ft, span steel i	orced concrete culvert	Bd. County Supervisors Co. Comrs., Norristown W. O. Crisman, Co. Eng Edward Burt, Co. Collector B. W. Hopkins, Co. Aud H. Benson, County Clerk John McGregor, Town Clerk John McGregor, Town Clerk D. A. Keefe, Engr., Athens M. L. Cooke, Dir. P. W L. G. Knipe, Engr. Phoenix J. S. Kidwell, Co. Engr H. Broeker, Clk. Co. Comrs S. B. Rambo, Supt. of Pub. Gr. and Bldgs.
ll., Freeport2 p.m., Dec Pa., Harrisburg10 a.m., Dec	. 1462.5-ft. span steel t . 15Const. 59½-ft. span	russ bridge plate girder bridge in Erie Co	. Harry Miller, Twp. Clk. R. J. Cunningham, St. Hwy.
Ky., Stanfordnoon, Dec	. 15. Making cuts and fi	lls and building several bridges an	d C R Cooper Clk Fiscal Court
N. Y., Lancaster	15. Constructing two 1 15. Const. abutments, 16. Constructing 7 reints. 16. Constructing reinforms. 16. Constructing bridge 18. Constructing 120-ft. 18. Constructing 330-ft. 18. Constructing steel	oridges. bridges, etc., for flood prevent. wk. forced concrete or steel bridges reed concrete bridge s and concrete work for 1916 span steel bridge. steel bridge, cost \$13,690 bridge.	F. H. Maute, Twn. Clk. Bd. of Pub. Wks. Benj. Jordan, Co. Hwy. Supt. H. C. Houser, City Clerk. M. J. Bouse. Co. Clk. County Clerk. County Clerk. R. O. Edwards, Co. Hwy. Supt., Bloomington.
Pa., Butler10.30 a.m., Dec	19. Repairing and re-fi 21. Steel transmission 21. 5-span reinforced c 21. Constructing concre 23. Constructing 2 brid 3. Steel bridge over E 3. Constructing bridge 5. Galvanized and stee	o over Mullica river	Bd. of Chosen Freeholders Towl Engring. Co., Omaha W. B. Scott, Clk., Co. Comrs.
O. C., Washington.10:30 a.m., Dec		centrifugal pumps, steel cables, etc	. F. C. Boggs, Gen. P. Officer
Il Pivarsida 9 nm Dag	19 Digging 9 950 ft of	ar trench 0 ft doon	Panama Canal
oel., WilmingtonDec. Iinn., Duluth11 a.m., Dec. Iiss., ClarksdaleDec. al., San DlegoDec.	13 Garbage disposal . 13 60-horsepower chas: 14 One ¼-ton electric 14 One 1-ton automobi	sis and ambulance bodydelivery truck	Bir., Chicago Board of Health W. H. Borgen, City Clk. M. W. Purcell, City Clk. Samuel McGowan, Paymaster Gen., Washington, D. C.
f. Y., New York	14 Dredging in Newark 14 Collecting garbage 15 Wire for electrical 15 Furnishing garbage 15 71 bicycles for polic	Bay and Passaic River	U. S. Engineer, Army Bldg. Board of Health. O. L. Schwartz, State Hosp. Gen. Pur. Off., Panama Canal A. Woods. Police Comr.

#### BIDS ASKED FOR

STATE CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Col., Denver10 a.r	n., Dec. 15 Supplies, includ.	asph., cement, gravel, pav. blks.,	sand, C. J. Pitcher, Comr. Finance
N. J., Prospect Park 8 p.r	n., Dec. 16 Collection and dis	posal of garbage for 2 years	Thos. Fraser, Clerk
N. Y., New York3 p.1	n., Dec. 16. Dredging in the	North river	Cabot Ward, Pres. Pk. Comrs.
N. J., Atlantic City	Dec. 16 Sale of street di	rt ulphuric and nitric acid	J. B. Thompson, Dir. of Sts.
N. J., Dover	n Dec 20 Const dams head	gates & other irrigation improver	nents R. L. McKnight, Secy. Ward
Tex., Darstow a.i	ii., Dec. 20 Consc. dams, nead	Saces & other misacionimproven	Co. Irrigation District
D. C., Washington	Dec. 21 Constructing post	office at Attleboro, Mass	Superv. Archt., Treas, Dept.
Fla., MiamiNoo	n, Dec. 22 Constructing cond	rete dock and other harbor work.	City Clerk
D. C., Washington	Dec. 22 Constructing post	office at Aurora, Neb	Superv. Archt., Treas. Dept.
D. C., Washington3 p.n	a., Dec. 23. Installing electric	elevators in post offices at Bri	attle-
Ind Indiananolis 10 an	Dec 98 One automobile to	n, Ore., and Ardmore, Okla	J. A. Wetmore, Supv. Arch.
D. C. Washington 3 p.r	n. Dec. 29. Constructing post	office at Missoula, Mont	J. A. Wetmore Suny Arch
D. C., Washington	Dec. 30 Constructing post	office at Ridgway, Pa	J. A. Wetmore, Supv. Arch.
D. C., Washington	Dec. 30 Furnishing hardw	are, etc	Supt. of Prisons
		ater at Key West	
		50-ton garbage crematory	
D. C., washington	Jan. 6 Constructing 400-1	t. steel towers at Guam radio static	onBur. of Yds. & Docks, Navy Dept.
D. C. Washington 3 p.n	Jan. 10 Constructing U. S.	post office at Titusville, Pa	J. A. Wetmore Suny Arch
D. Ci, it denting contitute pin	in, outil toll commercial	, hone owner the annual man, a million	it ormore, bupt. arrom

#### STREETS AND ROADS

Tueson, Aria.—Contract for paving on Stone Ave., Carroll St., McCormick St., 17th St. and 6th Ave., comprising what is known as southside district, will be let at once at special meeting of City Council. The O. & C. Construction Co. bid was \$2.171 per square yard and Warren Bros. Paving Co. \$2.155 per square yard. The extras such as culverts, gutters, sidewalks were varying and will have to be figured to decide the contract. The work will all be done under Warren Bros. bitulithic patents, no matter who gets the contract. The O. & C. Co. has just won big \$200,000 contract for the construction of 17 miles of country roads in Yuma County. The roads will be constructed under the Warren patents.

Los Angeles, Cal.—Ordinances have been adopted for improvement of various streets.

Los Angeles, Cal.—Final ordinance has

Los Angeles, Cal.—Ordinances have been adopted for improvement of various streets.

Los Angeles, Cal.—Final ordinance has been adopted for: Paving of Effie St. from Allesandro St. to a point 247.88 ft. westerly. Grading and oiling of Edward Ave. from Morse Ave. to Ave. 31. Grading and oiling of Arvia St. from Isabel to Cypress Ave. Grading and oiling of Dexter St. from Baltimore to Mendota. Paving of Griffith Ave. from 14th St. to Jefferson St. and other streets.

Ontario, Cal.—It is assured fact that E. State St. and Euclid Ave., from Southern Pacific tracks to State St., will be paved in near future, for time in which protests might be filed has elapsed and Council has adopted a resolution ordering work done. Bids for this work are to be opened by Council on evening of Monday, Jan. 10, 1916. The resolution ordering improvements on A St., between Laurel and Paul Aves., has also been adopted, there having been no protests filed.

Richmond, Cal.—Council is forming a

filed.

Richmond, Cal.—Council is forming a plan to extend Panhandle Blvd.

Ross, Cal.—An expenditure of \$20,000 for street improvements is planned by the local trustees. The amount will be devoted largely to rebuilding of present thoroughfares. Proposition will probably be submitted to the electors for approval.

Sacramento, Cal.—Commission ordered

ably be submitted to the electors for approval.

Sacramento, Cal.—Commission ordered that bids for the work on the Roseville-Auburn lateral be advertised for. The job is to be divided into two units: from Auburn to Penryn and from Penryn to Roseville. Bids will be asked for the construction of the Corning-Proberta unit in Tehams County, a distance of ten miles and a quarter. Orders also were issued to call for bids for a bridge across Petaluma Creek, between Marin and Sonoma Counties.

Bridgeport, Conn.—Development of North End by opening of new street directly connecting northern section of city with East Side is being contemplated by City Plan Commission and number of interested property owners, It is declared the project would cost but \$50,000.

Bartow, Fin.—Election to vote on issuing road bonds in sum of \$1.000,000 will not be held until March, 1916. Survey of 212 miles of road will be made and bids will be invited from contract-

Cicarwater, Fla.—Election has resulted in favor of issuing 5 per cent, 30-7ear road bonds in sum of \$715,000.

Tampa, Fla.—Movement has been started by taxpayers along Hillsborough River to bring City Council and Board of County Commissioners in agreement in matter of building boulevard along east bank of river to Sulphur Springs.

Kankakee, III.—City has taken its most important step toward good roads when resolutions were passed at recent meeting of commercial assocation recommending to Board of Supervisors that they issue bonds aggregating \$750,000 for construction of 100 miles of good roads.

Evansville, Ind.—The county treasurer has sold \$9,000 of road bonds to the City National Bank of Evansville.

National Bank of Evansville.

Fort Wayne, Ind.—Board of works has under consideration petition asking the opening of street between Indiana and South Wayne in line with Dayton Ave. and Oakdale Pl. Board has filed petition asking for walks on both sides of Burnett Ave., from Indiana Ave. to South Wayne Ave.

Burnett Ave., from Indiana Ave. to South Wayne Ave.

Greensburg, Ind.—County pike bonds for \$13,280 were sold for a premium of \$214.60.

Muncle, Ind.—County Treasurer Gola Williamson has sold issue of Delaware County road bonds to Gavin L. Payne Co., of Indianapolis. Bonds were in sum of \$4,880 and are for construction of Amos D. Hoober road, on county line between Delaware and Henry Counties. Bonds sold for par, accrued interest and premium of \$83.

New Albany, Ind.—In competition with six outside concerns, the Mutual Trust & Deposit Co., of New Albany, purchased \$10,116 county road bonds sold by Claude A. Sittason, County Treasurer, at premium of \$176.75.

Portland, Ind.—L. M. Via, Henry McDonald and L. O. Bergman filed their report Dec. 1 as viewers in the matter of the petition of Wilson Frank et al, for a brick road. The petitioners asked for a brick road from Water St. to the cemetery, a distance of 3,450 ft. Viewers in report recommend construction of a brick highway on concrete base. Samuel Brunson, M. H. Hart and L. O. Bergman filed their report Dec. 1 as viewers in the matter of petition of A. L. Jaqua et al, for a brick highway from Meridian St. west on Seventh St. to the cemetery. They recommend construction of proposed improvement.

Cedar Rapids, Ia.—Council is considering more modern street cleaning equipment. Present methods admitted out of date.

Centerville, Ia.—The Iowa Better Roads Commission in Des

date.

Centerville, Is.—The Iowa Better Roads Commission in session in Des Moines has adopted resolutions favoring anticipation of taxes for road building, by bond issues, using county as a unit, and objecting to any increase in taxes for road work.

Muscatine, Is.—Issuance of bonds for improving of roads is being urged.

Newton, Kam.—An ordinance has been adopted providing for the paving and curbing and guttering of parts of Walnut St.

nut St.

Olathe, Kan.—By a vote of 18 to 5, property owners along section of proposed Jefferson Highway between this city and Miami County line, declared for building a rock road and authorized the commencement of preliminary work at a meeting at Bonita Nov. 30. Committees will circulate petitions for a benefit district at once. Rocking of this

section will give an all oil and rock road clear through Johnson County.

Pittsburg, Kan.—Ordinance has been passed to provide for curbing and guttering, grading and paving of Pine St. from the south line of Rose Ave. to the north line of Euclid Ave., known as Curbing District No. 84-C and Paving District No. 104-P.

Levington Ky.—Street improvement

tering, grading and paving of Pine St. from the south line of Rose Ave. to the north line of Euclid Ave., known as Curbing District No. 194-P.

Lexington, Ky.—Street improvement bond sale ordinances covered ten streets in Bell Pl. and are for \$20,868.07. The Walton Ave. bonds are for \$10,472.65.

Paducah, Ky.—With aid of state eight counties west of Cumberland River will improve 34.04 miles of roads this year at cost of \$94,851, according to figures compiled by Walter F. Brooks, United States Senator Highway Engineer, who is representing Road Commissioner Robert C. Terrell in this part of Kentucky. Twenty-five and eighty-one one-hundredths miles is hard-surfaced road, while 8.16 miles is of earth only. The average cost per mile is \$2,782, or about \$300 below estimate of expert engineers. The expenditure of \$94,851 is allotted as follows: Ballard, \$8,500; Carlisle, \$9,639; Hickman, \$3,578; Fulton, \$13,200; Graves, \$30,109; Calloway, \$5,195; McCracken, \$13,486; Caldwell, \$11,044.

Paintsville, Ky.—Issue of street and sewer bonds in sum of \$80,000 has been declared valid by Court of Appeals.

Baltimore, Md.—Paving Commission will be able next year to proceed with its usual program of spending \$1,000,000 anore toward elimination of cobblestones.

Baltimore, Md.—Paving of Gay St. has been petitioned for.

Bostos, Mass.—Mayor Curley has announced his plans for extensive street improvements in downtown, Charlestown, South End and other districts, schedule prepared calling for expenditure of nearly \$2,000,000. The improvements on largest items in list are \$240,000 for Dorchester Ave from Andrews Sq. to Ashmont; \$201,000 for Main St., Charlestown; \$200,000 for Atlantic Ave., \$179,000 for Tremont St., from Boylston to North St. to Fulton St., \$30,000; Calinate St., \$12,000; Beach St., \$15,000; Edecation St., \$12,000; Beach St., \$19,000; Cilnion St., North St. to Fulton St., \$15,000; Filendes St., \$30,000; Cilnion St., Merchants Row to Commercial St., \$11,000; Filend St., \$33,000; Commercial St., Fleet to Washington St.,

000; Purchase St., \$27,000; Richmond St., Hanover to Atlantic Ave., \$15,000; Sudbury St., Court to Haymarket, \$12,000; South St., \$25,000; Washington St., Haymarket Sq. to Adams Sq., \$15,000; Harrison Ave., Harvard to Warren St., \$115,000; Shawmut Ave., Pleasant to Roxbury St., \$143,000; Tremont St., Boylston to Northampton, \$179,000; Dorchester Ave., Andrew Sq. to Ashmont, \$240,000; Main St., Charlestown, \$201,000; Chelsea St., Charlestown, \$49,000; Rutherford Ave., Charlestown, \$82,000; total, \$1,956,000. Ave., (956,000.

Main St., Charlestown, \$201,000; Cherlescown, Charlestown, \$49,000; total, \$1,956,000.

Boston, Mass.—Election will be held Dec. 14, 1915, when the following questions will be voted on: Shall the consent of the inhabitants of Boston be given to the widening of Boylston St. by the taking of a portion of Boston Common for said purpose? Shall the consent of the inhabitants of Boston be given to the widening of Park St. by the taking of a portion of Boston Common for said purpose? Shall the consent of the inhabitants of Boston Common for said purpose? Shall the consent of the widening of Park St. by the taking of a portion of Boston Common for said purpose? Shall the consent of the inhabitants of Boston be given to the widening of Tremont St. by the taking of a portion of Boston Common for said purpose?

Boston, Mass.—For asphalt or bitulithic pavement in Trent St., from Coleman to Clarkson Sts., Dorchester, following bids were opened Friday, Dec. 3, 1915; D. M. Biggs & Co., asphalt \$986.50; James Doherty, asphalt \$1,065.02, bitulithic \$1,069.92; Central Construction Co., asphalt \$1,068.80; Wm. J. Rafferty & Co., asphalt \$1,069.30, bitulithic \$1,069.30; Warren Bros. Co., asphalt \$1,115.0.

Fall River, Mass.—Highway loan of \$30,000 has been sold to W. L. Raymond & Co. for from one to five years.

Lowell, Mass.—As result of conference between County Commissioners and State Highway Commissioners in Boston, indications are that city of Lowell may soon have fine 30-ft. road down First St. from Bridge St. through Indian Orchard to Dracut line, at comparatively small cost, and be relieved of cost of its maintenance for all time.

Lawrence, Mass.—County Commissioners have opened bids on \$40,000 four months' note of Lawrence-Methuen Highway loan, and bid was awarded to Gloucester State Deposit & Trust Co., at 2.25 per cent.

Pittsfield, Mass.—City has decided to purchase an oiling and sprinkling machine.

at 2.25 per cent.

Pittsfield, Mass.—City has decided to purchase an oiling and sprinkling machine.

chine.

Pittsfield, Mass.—Contract for \$20,000 issue of sidewalk bonds was awarded Nov. 29 to Merrill, Oldham & Co., of

Boston.
Salem, Mass.—County Commissioners have awarded \$40,000 four months' note on Lawrence and Methuen highway to Gloucester Safe Deposit & Trust Co., at

on Lawrence and Methuen highway to Gloucester Safe Deposit & Trust Co., at 2.25.

Kalamazoo, Mich.—Definite action for promoting construction of pavement on Oakland Drive, running from Lovell St. to city limits was taken by city council Monday night. Resolutions were passed authorizing city engineer to make complete estimate of cost of building pavement from Lovell St. south to Howard St. Estimates are to be presented boards of trustees of Kalamazoo State Hospital and Western Normal. They will be placed before state legislature at next meeting.

Watervilet, Mich.—Bond issue of \$3,000 has been authorized for extension of Butternut St.

Duluth, Minn.—Thirty-four property owners along East Superior St. are signers of petition filed with City Clerk Borgen Nov. 29 asking for improvement of street next year.

Meridian, Miss.—City will shortly place on market issue of 6 per cent. paving certificates in sum of \$6,331.06.

Chillicothe, Mo.—Estimates by a government expert road engineer and adopted by the Saline County Rock Road Committee are for a macadam surface 15 ft. wide for the principal road (102.80 ml.) and 9 ft. for the secondary road (89,40 mi.), with a depth of 8 ins. in the center and 6 ins. at the side. All culverts to be built of concrete.

Harrisonville, Mo.—Citizens of Cass Co. are contemplating issuance of bonds to amount of one-half million dollars for purpose of building its portion of Jefferson Highway through county, and 100 miles of laterals extending throughout county. Connecting every town in county. Proposed improvements consist in building 125 miles of rocked roads at an estimated average cost of \$4,000 a mile.

Marshall, Mo.—The Saline Co. rock road committee, appointed six months

Marshall. Mo.—The Saline Co. rock road committee, appointed six months

ago, on Nov. 27 formally set in motion machinery which it is expected will carry through to victory proposal to vote \$1,310,000 in road bonds to be used in rocking 192.20 miles of highway. Under law road bond election must be called within 45 days after petitions asking it are filed. Committee has voted to present petitions in a few days. Estimated cost of county-wide rock road system as presented in Wonders report is: Principal roads, 102.80 miles, \$797, 549.50; secondary roads, 89.40 miles, \$450.925.36; total, 192.20 miles, \$1,248,474.86; engineering, 5 per cent, \$62,423.74; total cost, \$1,310,898.60. "Estimates are made for macadam surface 15 ft. wide for principal roads," said Wonders in his report, "and 9 ft. for secondary roads, with depth of 8 ins. in center and 6 ins. at side." Large part of culverts are built of concrete or of pipe with concrete walls. Estimate will provide for constructing remainder of concrete.

St. Joseph, Mo.—Ordinances have been introduced for various street improvements.

St. Louis, Mo.—Meeting will be held

Louis, Mo.—Meeting will be held ec. 24 to consider various street

on Dec. 24 to consider various street improvements.

Billings, Mont.—County will vote late in January on question of issuing highway bonds in sum of \$175,000.

Billings, Mont.—Another petition from North 30th St. paving district has been filed with city clerk. Owners of 101 out of 180 lots have signed it and they request boulevard through center of the street, with paving on each side 11 ft. wide. Paving requested is bitulithic with 4-in. concrete base. The district includes all of North 30th St. from half way between Seventh and Eighth Aves. to 12th Ave.; Eighth Ave. one-half block east and west of 30th St. Hastings, Neb.—City will be asking in about two months for about 175,000 sq. yds. of paving. Maps and specifications are now being prepared.

Omaha, Neb.—The following low bids were received Nov. 23 for paving: District 1342—National Roofing Co., asphalt, Class B, \$1.70; brick block, Class B, \$2.15; concrete, Class A, \$1.37; Hugh Murphy Const. Co., asphalt, Class B, \$1.83; asphaltic concrete, Class, A, \$1.59; Ford Paving Co., vertical fibre brick, Class B, \$2.16; vertical fibre brick, Class B, \$2.17; Ford Paving Co., brick block, Class B, \$2.16; vertical fibre brick, Class B, \$2.17; The Paving Co., asphalt, Class B, \$1.87; asphaltic concrete, Class A, \$1.94; H. J. Cathroe Co., brick block, Class B, \$2.16; vertical fibre brick, Class B, \$2.18; concrete, Class A, \$1.48; Chas. E, Fanning, brick block, Class B, \$2.16; vertical fibre brick, Class B, \$2.17; vertical fibre brick, Class B, \$2.18; urtical fibre brick, Class B, \$2.1

widening of street from Summerfield Ave. to Deal Lake, instead of from Summerfield to Asbury Ave. The hearing brought first formal estimates of cost of the work. Based on estimated prices of standard materials—brick, wood block or sheet materials—brick, wood block or sheet materials—Mr. Pittenger figured the cost at \$70,000 on basis of 26,555 sq. yds. at \$2.50 a sq. yd., with \$5,000 as "good measure." The county has appropriated \$20,000. Mr. Pittenger estimated that, in this calculation, the trolley company will appropriate \$16,000 and he allowed \$17,500, one-quarter of the cost, as assessment against city at of the cost, as assessment against city at large for street intersections. Elizabeth, N. J.—Repaving of 1st St, is being considered.

is being considered.

Haddonfield, N. J.—At meeting of Haddonfield Commissioners bonds to amount of \$67,000 were sold to M. M. Freeman & Co., of New York. Freeman concern bid 103.518. Bonds are \$60,000 worth for street improvement, and other \$7,000 are as park bonds for purchase of public park site.

as park bonds for purchase of public park site.

Miliville, N. J.—Proposed improvement of Weatherby Rd., leading from Tuckahoo, is being discussed.

New Brunswick, N. J.—Bids will be received by Board Freeholders on Monday, Dec. 20, for extraordinary repairs to nearly eight miles of the Cranbury Turnpike, between New Brunswick city line and Kingston lane.

Newark, N. J.—Roseville Ave. property owners have voted to petition Board of Works to lay wood block paving on that thoroughfare.

Passaie, N. J.—Petition of Van Houten Ave. property owners asking for improvement of that thoroughfare from River Drive to Clinton Ave., Clifton, was presented to Board of Freeholders Dec. 1 by Freeholder William T. Magee, of this city.

River Drive to Clinton Ave., Clifton, was presented to Board of Freeholders Dec. 1 by Freeholder William T. Magee, of this city.

Neptune, N. J.—South Main St. will be paved with bitulithic, the asphaltum concrete product of Warren Bros. Co. The improvement will cost about \$17,000. Two inches of bitulithic will form surface of improved street and beneath that there will be either one or two inches of trap rock or concrete. Bids will be asked only on bitulithic, but three varities of base construction will be considered. New road will be guaranteed for five years. It will be laid from gutter to gutter, not from curb to curb. The cost of improvement is to be borne equally by township, the county and the Asbury Park and Belmar Trolley Co., it is understood.

Cobleskill, N. Y.—Board of Supervisors has decided upon construction of following roads in Schoharle County: From Summit to Jefferson, 8 miles; Cobleskill to Carlisle, 6½ miles; Sloanesville to Esperance and Montgomery County line, 2½ miles.

Gouverneur, N. Y.—Among roads listed for construction in this vicinity in 1916 is one about 4 miles connecting Edwards village with new state highway, under construction from Gouverneur through Fullerville to the Edwards town line. With addition of this strip state road to Edwards will be completed.

Lockport, N. Y.—Bonds in the sum of \$3,731 to pay for expense of new Vine St. brick pavement were sold Nov. 27 by City Treasurer Hulshoff to H. William Bugbee, of Gasport.

Middleburg, N. Y.—Board of Supervisors has adopted resolutions providing for survey and construction of following roads in this county: Summit to Jefferson, 8 miles; Cobleskill to Esperance, Montgomery County line, 2¼ miles.

Newburgh, N. Y.—Because of the failure of James L. Kehoe, who had the contract for Mill St. paving, it is probable that city will readvertise for bids and again award the contract.

Rochester, N. Y.—Ordinance providing for widening streets on each side of Franklin Sq. has been passed as final. The cost of the improvement is \$15,000.

The cost of the improvement is \$10,000 able.

Yonkers, N. Y.—Transit Construction Co. of Mount Vernon was successful bidder for work of eliminating brade crossing over Harlem Railroad tracks at Pondfield Rd., in Bronxville. Amount of contract is assumed to be that fixed by amount allowed for elimination by public service commission, which is \$172,400 of which state pays 25 per cent. village 25 per cent, and railroad 50 per cent.

Wilson, N. C.—Work on new streets is soon to begin. The Board of Commissioners in conjunction with Consulting Engineer Anderson has decided to ave streets in business district before beginning work in residential section. Tarboro, Barnes, Nash and Spring Sts.

will be paved. The material is to be either vitrified brick, Durax blocks or sheet apphalt. The decision will be made later.

Lorain, O.—Permanent improvement of 70 miles of highways in Lorain County was decided upon by the County Commissioners Dec. 1. The improvement includes the pavement of Lake Shore road from Lorain to the Cuyahoga County line; the Cleveland-Elyria road in Ridgeville and Elyria Townships, 6.4 miles; the Oberlin-Norwalk road, Camden, Henrietta and Russia Townships, 7 miles; the Elyria-Lorain road, 4.5 miles; the Oberlin-Elyria road, 6.2 miles; Twinsburg-Elyria road, 10 miles; Ashland-Oberlin road, 13.2 miles, and the Medina-Norwalk road, 12.4 miles.

Springfield, O.—Ordinance has been

Springfield, 0.—Ordinance has been adopted to provide for issue of bonds in sum of \$7,400 for purpose of providing funds to pay city's portion of street improvements herein specified.

Steubenville, 0.—County Commissioners have voted bond issue in sum of \$24,000 to meet Jefferson County's share of expense of building of Ohio River market road, Bellaire to East Liverpool, which is now being constructed under supervision of State Highway Department.

market road, Bellaire to East Liverpool, which is now being constructed under supervision of State Highway Department.

Toledo, O.—Extension of West Woodruff Ave. is being discussed.

Eugene, Ore.—As tentative road burget of county court has already been made up, Commercial Club committee, which called upon court a few days ago, asking that \$10,000 be set aside in the budget for improvement of old military wagon road up Willamette and over the summit of Cascades, was requested to confer with road and highway committee of the Pomona grange to ascertain whether latter would be willing to divide amount set aside in budget for Eugene-to-coast road.

Johnstown, Pa.—Sealed proposals will be received at office of City Treasurer until 12 o'clock M, Monday, Dec. 13, 1915, for the purchase of \$100,000 highway improvement bonds of 1915.

Philadelphia, Pa.—Members of Highway Committee of Council recently approved a bill providing for paving and grading of sections of 50 streets, many of which are located in suburban sections. Bill will be submitted to Councils and proposed work will cost city more than \$100,000. At meeting of Survey Committee of Councils, a number of bills providing for placing suburban streets on city plan were approved.

Woonsocket, R. I.—Board of Aldermen have passed a special resolution appropriating \$20,000, \$17,000 of which is to be added to appropriation for straightening and widening Hamlet Ave. and Davison St. to Cumberland St., and for relocating and replacing two wooden bridges over the Blackstone River, and the Hamlet trench with reinforced concrete structures. Remainder of the \$20,000 is to be added to appropriation for straightening and widening Hamlet Ave. and Davison St. to Cumberland St., and for relocating and replacing two wooden bridges over the Blackstone River, and the Hamlet trench with reinforced concrete structures. Remainder of the \$20,000 is to be added to appropriation for straight. Athens, Tenn.—Bonds of \$100,000 to be used in construction of good roads may soon be issued in Mc

January term of county court.

Chattanooga, Tenn.—The Chickamauga Quarry & Construction Co. contractors will start to work Dec. 1 in building Sequatchie County's link of Dixie Highway shot line. Work is to begin at Dunlap and on Waldens Ridge, the two terminals, at same time, and will be pushed to a meeting with all possible speed. Highway will be built with crushed rock foundation and faced with pulverized lime stone and chert, same type of material that is used on Middle Tennessee Pikes. Sequatchie County recently sold \$50,000 worth of bonds to build its share of highway to Chattanooga. This will be beautiful section of highway from scenic standpoint. Eight miles of it run along crest of Waldens Ridge and 20 miles traverse beautiful Sequatchie Valley along river of that name.

Chattanooga, Tenn.—City Commission—

Chartanooga, Tenn.—City Commissioners are to try a new experiment in sale of bonds. Commissioners propose to sell

\$3,600 sidewalk bonds which will be offered to local investors.

Columbia, Tenn.—Bids will be entered at once to pave Garden St. to depot; Railroad St., from Main to S. High St., and W. 7th to city limits.

Ebenezer, Tenn.—A delegation of citizens residing in vicinity of West Emory were before Knox County Good Roads Commission, requesting them to build macadamized road from Ebenezer to Concord, a distance of about five miles. Commission took the matter under advisement and will act definitely at later meeting.

Johnson City, Tenn.—Much interest continues to be manifested in road bond election which will be held in Washington County on Dec. 18. It is believed that issue of \$425,000 will carry by handsome majority.

Knoxville, Tenn.—Ordinance has been passed to issue bonds for \$27,000 for paving work.

Dallas, Tex.—Bids were ordered by County Commissioners' Court Nov. 29 for 2,800 ft. of asphalt macadam roadway to run from city limits to Armstrong Ave. on Preston road. This stretch extends from present paving to asphalt macadam already on Preston road and covers strip of roadway that for long time was thought to be within city limits. County then was asked to join in paving. Asphalt macadam was recommended by Commissioner Jim Miller and call for bids for work was authorized.

Dallas, Tex.—Bids on furnishing country with cement for coming year were all rejected. All companies had not bid and bids submitted were withheld in order that all might participate on equal footing when new bids are asked. As year's work will include cement to be used in Commerce St. viaduct contract will be one of considerable magnitude.

Dallas, Tex.—Commissioner Miller has been authorized to buy car of oll for use on Richardson road.

Galveston, Tex.—Following are purposes and amounts of bond issues which will be submitted, Jan. 18: For paving, draining and improving the streets, avenues, alleys and public grounds of the city, \$250,000; repairing, restoring or submerging the water mains across Galveston Bay, \$200,000. Restoring repairing, filling, grading, paving, draining and improving streets, avenues, alleys and public grounds of the city as a particular of considerable magnitude.

Gilmer, Tex.—Election will be held Dec. 11 to vote on question of issuing Justice Precinct No. 7 road bonds in sum of \$75,000.

Sait Lake City, Utah.—On recommendation of city engineer, City Commission and endeavor to have county bear half the expense of changing road. Estimated cost of the work is about \$7,000. It was point on south side just below rained excepti

bear half the expense.

Portsmouth, Va.—Road Bond Commission of Norfolk County met Dec. 1 and opened bids for contract to improve 8 roads in Norfolk County, but question of awarding contract was deferred. There were four bids—O. I. Williams, R. P. Denby, F. J. McGuire and J. J. Batershill & Co.

Martins Ferry, W. Va.—Residents along road between Deep Run and Beach Spring school house are getting up petition which will be presented to county commissioners soon. The residents want road paved, and as they are now under new law they can petition for paving provided they stand 5 per cent. of cost. Senttle, Wash.—Resolutions have been

adopted for improvements of various

adopted for improvements of various streets.

Seattle, Wash.—Plans have been approved for grading of East 50th St., and concrete walks on 22d Ave. N. E. and E. 45th St.; also paving of Burke Ave.

Seattle, Wash.—Following bids have been received for street improvements: Hamlin St. paving—P. J. McHugh, \$15,-926.25; T. Ryan & Co., \$16,044.30; L. Coluccio, \$16,351; Washington Paving Co., \$17,952.25; 28th Ave. Northeast, grading and sidewalks—L. Coluccio, \$6,352.40; D. J. McLean, \$6,362; Jarvis & Burkheimer, \$6,457.50; Sloane Bros., \$6,426.50; J. P. Anderson, \$6,454.90; Andrew Peterson, \$6,501.25; A. E. Schold & Co., \$6,532.30; B. H. Petley, \$6,492.20; Russell & Gallagher, \$6,638.50; Doyle & Keenan, \$6,805.75; Henry Brice, \$6,815.15; McGuire Bros., \$6,600.25; Western Ave. paving—Krogh & Jessen, \$28,022.65; Ferguson Const. Co., \$28,723.72; Jahn Const. Co., \$28,176.72; P. J. McHugh P. & C. Co., \$28.328.15; Doyle & Keenan, \$28,971,45; F. McLeilan, \$28,337; Sound Const. & E. Co., \$33,535.53; T. Ryan & Co., \$28,273.80; L. Colluccio, \$29,741.14; G. Argentieri, \$28,857.80; D. H. Traphagen, \$29,320.05; City Contracting Co., \$27,115.34; Sparger Concrete Co., \$29,356.50; A. J. Baumgartner, \$28,500.35; Washington Pav. & Const. Co., \$27,857.10.

Milwaukee, Wis.—Present plans call

\$28,500.35; Washington Pav. & Const. Co., \$27,857.10.

Milwaukee, Wis.—Present plans call for early improvement of about 15 miles of roads along new county loop. Roads to be improved are the Silver Spring Rd., 4½ miles, from the Whitefish Bay Rd., to the Fond du Lac Rd., including a \$40,000 bridge over the Milwaukee River; Lovers' Lane, from Lisbon Rd. to Watertown Rd., 3 miles; Ryan Rd., from Chicago Rd. to Kilbourn Rd., 4 miles; Racine-Waukesha Rd., from St. Martins to Loomis Rd., 1½ miles; Loomis Rd. extension to Center Rd., 3 miles.

Superior, Wis.—Resolutions passed at meeting Nov. 30 provided for extension of alley between Bay and West Third Sts. from Hill Ave. to G Ave. and between East First and East Second Sts. from Bluff Creek to Francis Ave.

#### CONTRACTS AWARDED

Dothan, Ala.—For 21 miles of road, to Boyd & Bradshaw, Columbia, Miss., and Jordan & Phillips, at about \$100,000.

Dothan, Ala.—By Houston County Board of Revenue contract to Boyd & Bradshaw and Jordan & Phillips to construct graded roads to cost about \$100,000.

Gadsden, Ala.—By Etowah County Highway Commission to W. J. Bradford & Co. to build 11 miles of Walnut Grove road from Ivalee.

Fairville, Cal.—Contracting firm of Borland & Ayers, of Oakland, was awarded contract for grading of four miles and two-tenths of highway between Reclamation and Fairville, Sonoma County.

Pasadena, Cal.—Contract for work on Prospect Ter. has been awarded to J. E. Haddock at following prices: Paving, per sq. ft., 7.9c.; curb, per lin, ft., 56c, gutter, per sq. ft., 14c.; fence, complete,

San Gabriel, Cal.—For improving portion of Las Tunas Drive, to M. R. Co., Inc., Fernando Building, Los Angeles,

tion of Las Tunas Drive, to M. R. Co., Inc., Fernando Building, Los Angeles, at \$17,930.

Clearwater, Fla.—By city to Pinellas Construction Co., 'Augusta, Ga., at \$32,806.72 to grade and pave with vitrified brick, including drains and inlets, Fort Harrison Ave., from Eldridge St. to corporate limits.

Jacksonville, Fla.—W. R. Fuller of this city, state agent for one of biggest cement manufacturing firms in country, has just closed order with W. S. McRae & Son, of St. Petersburg, for 72,000 sacks of cement, to be used in building some 146 miles of concrete curbing for roads in Pinellas County. Road contractors are Edwards Construction Co. of this city. Pinellas is to build 73 miles of brick-paved highways out of \$715,000 bond issue recently voted for that purpose.

Indianapolis, Ind.—Contract has been signed with C. C. King & Sons for construction of south drive of Pleasant Run Parkway from Raymond St. to Beecher St., at estimated cost of \$22,986, Plans and specifications were ordered for subway under Belt railway near Beecher St.

New Albany, Ind.—The New Albany Board of Public Works has accepted bid of Goulding Bros. on construction of alley between West First and State Sts. from Main to Market. Bid was \$1.98 a ft. Council Bluffs, In.—Contract for cut-ting new street from Franklin Ave. to

top of Hazel St. hill has been let to C. F. Sales & Son, who will commence work on project at once. It is planned to spend \$500 on grading out of roadway, but more money will be spent later in spreading cinders over it.

Iols, Kan.—For paving on South Chestnut St., North Chestnut St. and alley in rear of Physicians and Surgeons Hospital to Hanreddy & Ross, city, at \$7,000.

Associated to Hanreddy & Ross, city, at \$7,000.

Newton. Kan.—Estimates submitted by A. Jaicks Paving Co. and approved by city engineer wese approved and ordered allowed. This includes contract No. 6 which amounts to \$1,518.41; contract No. 7 amounting to \$4,882.64, and contract No. 9 amounting to \$1,916.07.

Pittsburg, Kan.—Paving of S. Broadway with National paving on concrete base has been awarded to Williams Const. Co. The plan selected calls for removing top layer of brick, putting on 2-in. layer of concrete and then 2-in. National top. This costs 99 cts. a sq. yard. It makes cost \$5,040 more on entire job than under other specifications.

Lebanon, Ky.—By Marion County Commissioners contract to T. M. Estes and Forrest Ward, at \$13,420, for improving 9 miles Bradfordsville Pike from Lebanon to Bradfordsville.

missioners contract to T. M. Estes and Forrest Ward, at \$13,420, for improving 9 miles Bradfordsville Pike from Lebanon to Bradfordsville.

Lexington, Ky.—Contract has been awarded for improvement of Winslow St. to Carey-Reed Co., at following bid: Asphalt paving, Type C, with Trinidad Pitch Lake asphalt, \$1 per sq. yd.; headerstone, 50c. per lin. ft.; concrete, \$4.50 per cu. yd.; excavation, 30c. per cu. yd.; combined cement curb and gutter, 55c. per lin. ft.; resetting manhole tops, \$2.50 each; manholes, new, \$30 each; resetting old catch basins, \$2.50 each; catch basins, new, \$40 each; following bid: Asphalt paving, Type, 50c. per lin. ft.; 10-in. pipe, 60c. per lin. ft.; 11-in. pipe, 60c. per lin. ft.; 12-in. pipe, 70c. per lin. ft.; 15-in. pipe, 80c. per lin. ft.; 18-in. pipe, \$1 per lin. ft.; 24-in. pipe, \$1.75 per lin. ft. Also to same firm for improvement of W. High St., at following bid: Asphalt paving, Type B, \$1.20 per sq. yd.; headerstone, 50c. per lin. ft.; concrete, \$4.80 per cu. yd.; combined cement curb and gutter, 55c. per lin. ft.; resetting old curb, 15c. per lin. ft.; cement curb with steel protection radii, \$1 per lin. ft.; resetting manhole tops, \$2.50 each.

Lexington. Ky.—For improvement of W. Main St., to Carey-Reed Co., at following bid: Asphalt paving, Type A, \$1.30 per sq. yd.; headerstone, 50c. per lin. ft.; cement curb with steel protection radii, \$1 per lin. ft.; resetting manhole tops, \$2.50 each.

Morganfield, Ky.—By Union County Commissioners contract for improving Unionton and Boxville roads, to Collins & Pavy, Mt. Vernon, Ill., at \$28,508.

Monroe, La.—To Merrill Road Improvement Co., of Chattanoaga, Tenn., at about \$40,000, contract for construction of 36,000 sq. yds. of gravel road with tarvia topping and concrete curbs and gutters.

Onkdale, La.—By city to De Jersey & Naft, of De Ridder, La., to construct 3 miles cement sidewalk.

Hopkinton, Mass.—Contract to reset curbing, pave the gutter and lay new sidewalk on south side of Grove St., from corner of Main to the south li

only company coming within the \$1,000 appropriated.

Kansas City, Mo.—Park Board will award contract for grading of Meyer Blvd. from Pasco to Wornall Rd. This is last link needed to connect South and Southwest park districts. Actual grading of Meyer Blvd. from Pasco east to Swope Pkway. will begin. The grading of Benton Blvd. from Brush Creek south to Swope Pkway. will be discussed by board at next meeting.

Springfield, Mo.—For 9% miles of road in Ingram Special Road District to Otto. Chapman, Strafford, at \$22,000.

Jersey City, N. J.—For repaving Old Bergen road with asphalt to Crichfield Constr. Co.

Linden, N. J.—Fred McGillvray was awarded the contract for the construction of concrete sidewalks in Stimpson St. and Mitchell Ave., at 50 cts. per lin. ft.

Long Island City, N. Y.—For repaying Rockaway Blvd., from Park Ave. to Remsen Ave., Rockaway Beach, with granite block, to Henry J. Mullen Constr. Co., Flushing, at \$57,456.

Mount Holly, N. J.—Following contracts awarded for water bound macadam payement to Manwaring & Cummins, 1326 Chestnut St., Philadelphia, Pa., at \$5.710 for Vincetown and Buddtown road, about 13,280 sq. yds., and \$4,579 for Vincetown and Eayerstown road, about 10,648 sq. yds. Other bidders: Joseph F. Burk, Plainfield, N. J., \$7,702 and \$6,174 respectively: The Juniata Co., Philadelphia, Pa., \$8,234 and \$6,283 respectively: And Kelley-McFeely Co., Camden, N. J., \$3,030 and \$7,134, respectively. New Brunswick, N. J.—Contract has been worded to Torma F. Dunige, and the Perth Amboy city limits, at cost of \$5,749,16, by Middlessx County Board of Freeholders. This work will complete road work from Metuchen to Perth Amboy. Schenectady, N. Y.—State Highway Commission on Nov. 24 has let contract for construction of Glenville section of Sacandaga Rd. to DeGraffe & Hogeboom, Inc., of Kingston, their bid of \$33,445.50 being lowest. Contract calls for 4.22 miles of water bound macadam highway on the Scotia and Saratoga County line, part 1, contract 1338. Westfield, N. C.—Contract for building good roads in Westfield Township, Surry County, has been let to C. C. Jordan, who has been making the Dobson Township roads. Westfield is to put \$30,000 into this enterprise.

Cincinnati, O.—For improving Summit Ave., in Springfield and Sycamore Township roads. Westfield is to put \$30,000 into this enterprise.

Cincinnati, at \$4,744.

Toledo, O.—Five contracts have been let by Board of Control. Peter Bros. & Co. drew award for paving Waterworks Drive, from Broadway to the Wabash railroad right-of-way, at bid of \$469.22. McKinney Bros. were awarded vitrified brick paving of Bancroff St., from the New York Central railway to western city line. The bid was \$15,599.23. The wood block paving of 13th St., between Adams and Madison Aves., will be done by Russell & Jennison, for \$4,730,35.

Okmuigee, Okla,—For improving nu

Bolling to Administrative Board. Saville & Claiborne, the contractors who are widening Dock St. from 17th to 14th St.. will be given the contract.

Charleston. W. Va.—For 1½ miles of warrenite road in London and Polka District, to Atlantic Bitulithic Co at \$36,855.

#### SEWERAGE

San Francisco, Cal.—The board has requested the Supervisors to appropriate \$600 for covering exposed pipes in the Reis tract.

Stockton, Cal.—Plans and specifications for a sanitary main sewer on Wyandotte St., from McCloud's Addition to Lower Sacramento Rd., were adopted by the commissioners at a meeting of City Council Nov. 23. Bids will be called for immediately. When further rights of way are secured the Wyandotte main sewer will serve as outlet for sewage

of the Sperry and McCloud Additions, where the laterals have already been laid. Main will be 16 ins. in diameter most of its length, being 12 ins. in diameter for only a short distance.

Stamford, Conn.—Bond issue of \$30,000 to pay for new storm drain leading south from Main and Grove Sts. has been sold to R. M. Grant & Co., of New York.

Hugo, Colo.—City Council is considering question of issuing sewerage bonds in sum of \$10,000.

Huge, Colo.—City Council is considering question of issuing sewerage bonds in sum of \$10,000.

Jacksonville, Fla.—Plans for spending of \$375,000 sewerage bond money were discussed yesterday afternoon at joint meeting of sewer committee of Board of Bond Trustees and Paving and Sewerage Committee of City Council. Councilmen agreed upon plan which will call for all money to be available for sewers and drains under sale of bonds this year and next. Several changes were made in proposed schedule and engineering department will draw up plans agreed upon, readjust estimates and report will be sent to Council for final action. It was agreed that \$154,600 should be spent for drains. This is just \$25,000 more than recommended by engineers as absolutely necessary for the present. This amount is divided as follows: Cedar St., \$25,800; Newnan St., \$9,600; Barrs St., \$16,300; 11th St., \$7,700; Wilcox St., \$3,500; Liberty St., \$52,500; Henry St., \$10,700; Main St., Phelps St. to Hogans Creek, \$1,000; Davis St., \$2,500; Georgia St., \$7,200; Aubert and Smith Additions, \$17,800; total, \$154,600. When the sewerage matter was taken up considerable discussion took place. The recommendation of the engineering department included separate estimates for trunk lines and for laterals. Estimates submitted by the engineers are as follows: Trunk lines, Stonewall St. outfall, \$8,980; Jefferson and Clay Sts. outfall, \$17,010; total, \$160,530. With laterals included amounts are: Stonewall St., \$145,340; Jefferson and Clay Sts., \$41,970; Osceola St., laterals only, as a trunk line already exists upon this street, \$39,420.

Oak Park, III.—Pipe sewers extending about 3% miles, costing \$23,923, are contemplated. Address Board Local Improvements.

Peoria, III.—County Judge Stone has entered order of default and confirmations of Averyville sanitary sewer.

rovements.

Peoria, III.—County Judge Stone has entered order of default and confirmation in case of Averyville sanitary sewer system and work toward passing bond issue ordinance will be begun by Village Board at next meeting.

Ft. Branch, Ind.—Construction of sanitary sewer system and purification plant are being planned to cost \$15,000.

Greencastle, Ind.—Plans are being considered for sewage purification plant and sewer from this city to Big Walnut Creek.

and sewer from this city to Big wainted. Creek.

Indianapolis, Ind.—Board of public works has confirmed resolution for construction of sewer along White River levee from Henry St. to Maryland St., at estimated cost of \$5,000.

South Bend, Ind.—Resolutions were ordered prepared on petition presented to Board of Public Works for pipe sewer and water main on Caroline St., between Lincoln Way East and Dayton St.

Lexington, Ky.—Bonds in sum of \$350,000 will be sold for erection of sewage disposal field and extension of north main sewer.

Owensbore, Ky.—Contract for sewer system will be awarded in January. Citizens have voted \$250,000 bonds for this purpose.

this purpose.
Paintsville, Ky.—See "Streets

Roads."

Boston, Mass.—For pipe sewers and drains in Mendelssohn and Hobson Sts. West Roxbury, following bids were opened Friday, Dec. 3, 1915: Wm. L. Dolan, \$1,989: Daddario & Booth, \$2,066: Chas. Latorella, \$2,140; M. De Sisto, \$2,173.54; Anthony Cafalo, \$2,169: Louis Balboni, \$2,231; Frank Drinkwater, \$2,542: V. Grande, \$2,754. For pipe sewers and drains in Lenoxdale and Myrtlebank Aves., Dorchester, following bids were opened Friday, Dec. 3, 1915: Jas. J. Conway, \$723.20: Geo. J. Regan, \$807.45; Daddari & Booth, \$923.95; M. H. Loonie, \$984.80: J. F. Carroll Construction Co., \$1,075.35; V. Grande, \$1,098.35; D. M. Biggs & Co., \$1,089.30; E. S. Butterfield & Co., \$1,148.34; Frank Drinkwater, \$1,57.25.

Pierce, Neb.—Special election will be held Dec. 14 to vote on question of issuing not exceeding 5 per cent sewer bonds to amount of \$20,000.

Caldwell, N. J.—Election has resulted

by vote of 226 to 109 in favor of issuing sewer improvement bonds in sum of \$10,000. John J. Van Orde is Borough Clerk.

Hillside, N. J.—Committeemen are considering a \$10,000 sewer. Engineer Luster has submitted plans.

Johnstown, N. Y.—Common Council has decided to submit to voters a proposition to issue sewer bonds in sum of \$10,000.

Niagara Falls. N. Y.—Possai

\$10,000.

Niagara Falls, N. Y.—Board of Estimate and Apportionment has called for bids for \$8,000 worth of sewer bonds returnable on Dec. 10.

Wappinger Falls, N. Y.—City is to vote for bond issue of \$15,000 for completion

wappinger Falls, N. Y.—City is to vote for bond issue of \$15,000 for completion of sewer system.

Winston-Salem, N. C.—Chairman Owen, of sewer committee has submitted proposition connected with installation of sewer system in Granville development in West Salem by owners of the property. It was shown that company proposed to install between 2,500 and 3,000 feet of sewer lines, part of which must be laid on one of city's streets.

Chillicothe, O.—Ordinance has been passed by City Council for construction of a 12-36 and 40-in, storm water sewer lateral in Webster Ave. Estimated cost, \$4,400. H. M. Redd is C. E.

Cincinnati, O.—Resolutions have been passed for sewering of various streets.

Mansfield, O.—By inducing State Industrial Commission to reconsider their former action and finally waive claim on Mansfield sewage disposal bonds in sum of \$110,000, City Solicitor Chew has said bonds will be at once advertised for sale and offered Dec. 30. Bids for additional materials from improvement of sewage disposal plant will be opened soon when a contract with one of the bidding construction concerns for a large part of work will be entered into.

Marion, O.—Council has passed resolutions to construct storm water sewers and sanitary sewers on Henry St. and Uhler Ave.

Halleyville, Okla.—City will call an elective to work bende for construction concerns for a contract in a lective to work bende for construction concerns for a large part of the contract with one of the bidding construction concerns for a large part of work will be entered into.

Marion, O.—Council has passed resolutions to construct storm water sewers and sanitary sewers on Henry St. and Uhler Ave.

Halleyville, Okla.—City will call an election to vote bonds for construction of sanitary sewer system just as soon as a full report has been made by the Benham Engineering Co., Oklahoma City, Okla., who have been retained as consulting engineers. Probable cost will be \$50,000 for mains and laterals.

La Grande, Ore.—Contracts will be let in a few weeks for extensions to sewer system to cost \$16,000. L. D. Howland, City Engineer.

Philadelphia, Pa.—Bill calling for laying of main and branch sewers in various sections of city has been approved by Council.

Port Carbon, Pa.—Ordinance has been presented for the laying of an 18-in. storm water sewer on Laing St.

Houston, Tex.—City council has passed ordinance authorizing appropriation of \$51,000 for storm sewers to drain Main St. between tracks of Galveston, Harrisburg & San Antonio Railway and Bellaire Blvd., and an appropriation of \$21,000 for storm sewers on Hathaway St. from Baldwin to Crocker St.

Canadian, Tex.—The Chamber of Commerce of this city has strongly indorsed movement started by Mayor Oswell Hudson to install sewerage system for city. It is proposed to issue interestbearing warrants in sum of \$15,000 to \$20,000 with which to install system. Committees have been appointed to work out the details of plan.

Corine, Utah.—Chapin A. Day, of Chicago, president of Ogden Portland Cement Co., and treasurer of Marshall Field Co., has bought bond issue of \$175,000 of Corinne drainage district commission, at meeting of directors.

Superior, Wis.—The Board of Public Works received bids December 2 for the construction of the Faxon St. sewer, the first of the sewer jobs to be let. Cost of Faxon improvement is estimated at \$2,000. Sewer system to be constructed at Itasca will cost approximately \$15,000.

Superior, Wis.—At a meeting Nov. 36 City Commission passed resolutions providing for condemnation proceedings which will open way for part of

#### CONTRACTS AWARDED.

Stockton, Cal.—Chambers & Heafey were successful bidders for work of constructing 24-in. main sanitary sewer in southwestern section of city. Sewer will commence at pumping station at

corner of Washington and Harrison Sts. and will run south on Harrison to Church St., west on Church to West St., south on West to South Ave., and east on South Ave. to the McDougald Pl., where it will be connected with main sewer now being installed. The bids follow: Chambers & Heatey, \$24,050.41; Tibbits-Pacific Co., \$24,772.92; Plumenarez & McIntire, \$29,942.02; C. D. Vincent, \$31,925.09; T. J. Shea, \$38,850. Estimated cost was \$30,655.

Los Angles. Cal.—For construction of

Los Angles, Cal.—For construction of sewer on Kingston Ave, to Andrew Jayich at \$634, on 23d st., to Martin Chutuk at \$499, one on Middletown Pl. to Sam Kenly at \$993.

Kenly at \$993.

Washington, D. C.—By District Commissioners, 509 District Bldg., to Warren F. Brenizer Co., 141 Q St. N. W., to construct 18th St. and Connecticut Ave. sewers, and Geo. Hyman, 3401 16th St. N. W., to construct Benning road sewer main.

sewers, and Geo. Hyman, 3401 16th St. N. W., to construct Benning road sewer main.

Aurors, III.—For constructing sewers in Sewers District No. 11 (bids opened Nov. 24), to F. E. Kaminski, Watertown, Wis., at \$11,910. Other bidder, R. R. Kuchn, Aurora, \$12,105.

Marshall, III.—Contract for sewer has been awarded to Robert Thompson, or Marshall, at \$1,900.

West Frankfort, III.—For water works as follows: Wells, to Charles S. Laine, St. Louis, Mo.; construction, Katy Construction Co., Omaha, Neb.

Brockville, Ind.—In connection with water works as follows: Air compressor. Laidlaw-Dunn-Gordon Co., Cincinnatt, O., at \$2,340; chimney, Henie Chemical Co., Chicago, III., \$1,080; also boiler, at \$2,927. All bids on the pump have been rejected, and new bids will be asked.

Indianapolis, Ind.—For sewer, to Independent Construction Co., Terre Haute, at \$9,500.

Richmond, Ind.—F. E. Slick was awarded contract for the construction of sewer system and disposal plant in West Richmond. There were several bidders. The sewer system will be for section west of South West 7th St., between the National Rd. and Main St. Disposal plant will be located northwest of Gause green house. Slick entered a bid of \$5,670 for contract. Work on sewer plant will start whenever weather permits. Disposal plant will be constructed next spring:

Oakland, In.—For 13,500 ft. of sewers, to M. A. Camery, Harlan, at about \$10,000.

Boston, Mass.—For pipe sewers and drains in Washington St. North, from

\$10,000.

Boston, Mass.—For pipe sewers and drains in Washington St. North, from Stillman to Cross Sts., city proper, following bids were opened Monday, Nov. 29, 1915: John T. Shea, Jr., \$1,426.75; Thomas Russo & Co., \$1,431.75; Daddario & Booth, \$1,607; Anthony Baruffaldi, \$1,647.55; Louis Balboni, \$1,697; V. Grande, \$2,212.75. Contract was awarded to John T. Shea, Jr. Engineer's estimate, \$1,461.15.

Deer River, Minn.—P. Secutrons.

\$2,212.75. Contract was awarded to John T. Shea, Jr. Engineer's estimate, \$1,-461.15.

Deer River, Minn.—P. Seastrand, of Cambridge, Minn., has been awarded the sub-contract for the digging of Judicial Ditch No. 3, which is to be built west of Deer River, work to begin in the spring. This will be one of the largest projects in Itasca County and contract calls for an expenditure of \$104,000.

Asbury Park, N. J.—The Logan Construction Co., of New York, has just been awarded contract to install proposed sewer in District No. 2, Neptune Township. Five bids were considered by Neptune Township committee, the Logan Co's figure, \$3,957,180, being the lowest. The highest was \$13,251.10, by the Cantrell Co., Philadelphia. The sewer is to be completed within 60 days and it is stipulated contracting company shall employ 90 per cent of home labor.

Linden, N. J.—The township committee Nov. 29 awarded contract for construction of sewer in Wood Ave. from Borough line to Munsell Ave. to Mathew Wade of Elizabeth. His bid was \$1,377.90, while that of P. Foster Callihan was \$1,491.50. Fred McGillvery obtained contract for construction of sidewalks in Stimson and Mitchell Aves.

Dunkirk, N. Y.—The Dunkirk Mason & Contracting Co. has signed its contract and furnished necessary bond for construction of storm water sewer in E. 5th St. This runs from Park Ave. to Deer St. and its purpose is to relieve congestion in Park Ave. sewer. There will be 12-in. sewer from Park Ave. to Fox St. and from Fox to Deer, 15-in.

New York City, N. Y.—For making repairs to barrel and box sewers at 26th St. and North River, 37th St. and East River, 10th St. and East River, 10th St. and East River, 158th St. and North River, 37th St. and East River, 110th St. and East River, 158th St. and North River, 3d St. and East River,

and Stanton and Rivington Sts., East River, to Riverside Contracting Co.

Ningara Falls, N. Y.—Works board has awarded Dominic Spacone contract for laying sewers in Bath, Maple, Columbus and Stephenson Sts. at his bid of \$2,490.

Sandusky, O.—For intercepting sewer No. 2, to J. B. Sheets, Pittsburgh, Pa.

No. 2, to J. B. Sheets, Pittsburgh, Pa. Springfield, O.—Contracts were awarded by the city commission to Ray Cavanaugh for construction of sanitary sewers in Sheridan Ave., from Harrison to Willard, and first alley east of York, Mill Run to Railroad, and to Daniel Doyle for sewer in Liberty St. from Limestone to point 120 ft. east of Fountain Ave.

Limestone to point 120 ft. east of Fountain Ave.

Toledo, O.—For constructing main sanitary sewer No. 13, about seven miles long, 8 to 15-in. pipe, to Breymann & O'Neill, Nasby Bldg., Toledo, at \$51,907.
Cleveland, Tenn.—By city to A. C. Brooks & Co., Birmingham, Ala., at \$44,-600 to construct 16½ sewers of 20 to 8-in. diameter and Concrete Construction Co., Birmingham, Ala., at \$19,600 to build 2 concrete septic tanks. Walter G. Kirkpatrick is Engr., 704 Farley Bldg., Birmingham, Ala.

Knoxville, Tenn.—Contract for construction of 21 sewer laters in Park City was awarded to J. A. Ahler at last regular meeting of Council. Bid of Mr. Ahler was about \$12 under second lowest bidder. Ten bids were submitted. Bonds aggregating \$10,500 have been issued for this special work. Work on construction of these sewers will begin in ten days. Sewer committee of which W. F. Dick is chairman will be in charge of work.

Seattle, Wash.—Following sewer con-

work.

Scattle, Wash.—Following sewer contracts have been awarded: 13th Ave. N.
W. sewers, V. Ramaglia, \$2,998.04; Stroud Ave. et al., sewers, D. & V. Bressi, \$3,538.30; Sixth Ave., N. W. et al., sewers, Washington Paving Co., \$78,694.30.

Fond du Lac, Wis.—For sewer concetions to 36 private houses to August Krueger and Robt. Bernett of Fond du Lac. J. F. Hohensee is City Clerk.

#### WATER SUPPLY

WATER SUPPLY

Fairhope, Ala.—Election will be held in near future to vote on question of issuing the following bonds: water works, \$8,000; electric light, \$5,000.

San Francisco, Cal.—The Fire Commission, at its meeting Nov. 28, ordered the Spirng Valley Co. to install 40 additional hydrants throughout the district.

Whittier, Cal.—F. C. Roberts, engineer, Marsh-Strong Building, Los Angeles, will prepare plans for water and distributing systems to cost \$100,000.

Indianapolis, Ind.—The Indianapolis Water Co., in its proposal, offers to supply water for court house, jail and jail residence, including sprinkling privilege, for \$2,350, same price as the existing contract. It also offers to supply water for detention home and workhouse at meter rates.

Mishawaka. Ind.—Bids for furnishing

ter for detention home and workhouse at meter rates.

Mishawaka, Ind.—Bids for furnishing city with about 475 tons of castiron pipe were opened Nov. 29 at meeting of Board of Public Works. Five firms submitted propositions ranging in price from \$2.1 to \$28.86 per ton. The bidders were the United States Cast Iron Pipe & Foundry Co., of Chicago; the American Cast Iron Pipe Co., of Columbus, O.; James B. Clow & Sons, of Chicago; the Lynchburg Foundry Co., of Lynchburg, Va.; and the Massillon Steel & Iron Co., of Chicago. Bids were referred to Superintendent A. R. Klein for tabulation. Contract will be awarded at next meeting of Board.

Arma, Kan.—Permission to issue bonds for water main extensions will

at next meeting of Board.

Arma, Kan.—Permission to issue bonds for water main extensions will be asked from Public Utilities Commission by committee from City Council that will meet with Commission in Pittsburg. Such extensions are necessary, it is claimed, to put water works on equal footing as money maker with electric plant.

footing as money maker with electric footing as money maker with electron plant.

Emporia, Kan.—Notice is given that election will be held in city of Emporia, Lyon County, Kan., on Tuesday, Dec. 28, 1915, for purpose of voting on question of whether or not Board of Commissioners of said city shall have authority to issue bonds of said city in sum of \$150,000 for purpose of enlarging, extending and improving present water works system of said city.

Emporia, .Kan.—Ordinance directing Mayor to call election for purpose of submitting question of whether or not Board of Commissioners of said city shall have authority to issue bonds to sum of \$150,000, for purpose of extending and

improving present water works system of said city, was considered and passed by all members.

Topeks, Kan.—Cities of Humboldt and Chanute nave filed application with Public Utilities Commission for permission to issue bonds for improvement of municipal waterworks systems. Improvements contemplated at Chanute will cost \$25,000 while those at Humboldt amount to \$10,000.

to \$10,000.

Church Point, La.—Election may be held for voting on bonds for water sys-

towney, La,—Bids will be received by city until Dec. 14 for2 \$35,000 water works and eiectric light bonds. R. J. Boudreaux is City Clerk.

Hagerstown, Md.—The Public Service Commission of Maryland has just rendered opinion in matter or application of Washington County Water Co. for authority to issue \$550,000 par value of capital stock—\$150,000,000 thereof on account of increase in capitalization to cover cost of improvements to its facilities and other capital jurposes heretofore provided from earnings and proceeds thereof, together with proceeds of additional amount of \$400,000 of said stock to be used for further improvements, etc., greating company right to assue stock as requested and also to install meters for water measurement.

Fall Miver, Mass.—City has soid \$50,000 water loan to W. L. Raymond & Co. for from 1 to 30 years, at 4 per cent.

Watervilet, Mich.—Bond issue of \$23,000 has been authorized for erection of pumping station and installation of extensive water system.

Redwood Falls, Minn.—Contract No. 29 has been awarded to P. B. Jennings, or Wanda, Minn., for furnishing and laying water mains.

Billings, Mont.—County Commissioners have rejected all bids for installation of Broadview water system.

Butler, N. J.—A proposed increase in supply of Butler Water Co. will mean much to Butler, not alone in benefits to commercial users, but in increased protection against fire and through possible lowering of insurance rates in Butler proper. While company now has on hand supply of \$000,000 gallons, the proposed enlargement will give it 133,000,000 gallons. In spring according to officials of company work of laying 12-in. pipe line for three miles, from Apshawa reservoir, where 125,000,000 gallons of water is impounded, to the company's network of lines in Butler will be begun. This work, it is said, will be completed in early possible to work will be completed in early possible to the municipalities which have not yet expressed willingness to entering the coordinate of the Bernardsville concern.

Trenton

gineer, Rochester, for water system to cost about \$25,000.

Commerce, Okla,—Election will be held Dec. 23 to vote bonds in amount of \$40,000 for water works as per plans of engineers, the Benham Engineering Co., of Oklahoma City, Okla.

Clinton, Okla,—Bonds in amount of \$6,000 carried at special election held Nov. 30. Mohey from sale of bonds will be used in making investigations for water supply and the Benham Engineering Co., Oklahoma City, Okla., will start work immediately conducting tests, etc. It is probable complete plant will cost \$100,000, for which additional bonds will be voted later providing good supply or water can be found either from wells or impounding reservoir.

Erie, Pa.—During the administration of incoming Council, a \$200,000 reservoir probably will be constructed by Water Board to insure positive water supply at all times.

Erie, Pa.—J. N. Chester, Pittsburgh, consulting engineer, is preparing for

at all times.

Erie, Pa.—J. N. Chester, Pittsburgh, consulting engineer, is preparing for Water Board report in which he recommends huge reservoir for works and outlines tank such as he declares is re-

Water Board report in which he recommends huge reservoir for works and outlines tank such as he declares is required here.

Pittsburgh, Pa.—Election will shortly be held to vote on \$7,000,000 bonds, \$1,200,000 of which will be used for improving water system, R. Swan is director of public works.

Dallas, Tex.—Anticipating the early paving of Zang's Blvd., Board of City Commissioners on Nov. 29 authorized bids for purchase of approximately 14,000 feet of large water piping which is to be installed in Oak Cliff. Cost of the piping will amount to \$21,500. More than 5 U feet of 16-in. pipe is to be laid from Oak Cliff pumping station to Zang's Blvd. and then along Zang's to Sixth St. The 12-in will be installed from Sixth to Ninth St. on Zang's.

Fort Worth, Tex.—Business men of city will be asked to pass opinions on report of Holman & Laird following their survey of Ft. Worth water system at meeting not later than Dec. 1, before city commission takes any action, according to Mayor Tyra. He is yet undecided what day this meeting will be held. Following this meeting election on bond issue of \$300,000 to complete work recommended in report will be called.

Fort Worth, Tex.—An immediate bond issue of \$300,000 for completion of Lake Worth conduit, enlargement of filter plant and overhauling of distribution system is recommended by Holman & Laird, St. Louis consulting engineers, in their final report of survey of Fort Worth waterworks system, filed with City Commission. To complete conduit will cost \$112,000, to enlarge filter plant \$96,000, to build additional levees around Holly pumping station \$16,500, to repair Holly plant pumping engines \$25,000 and to construct 12-in. connection to North Side \$20,000. This makes total of \$263,500 necessary, not counting approximately \$40,000 needed to complete dual system of pipe distribution and to move centrifugal unit from south side plant to the Nut powder plant, putting it on dual service to insure all fire protection necessary without putting fire pressure on entire domestic

Galveston, Tex.—See "Streets and Roads."

Seattle, Wash.—Plans have been approved for laying of water mains or Wyoming Ave.

Hayward, Wis.—City Council is considering question of issuing water works system bonds in sum of \$110,000.

Milwaukee, Wis.—City council has approved of report of committee for extending Linwood Ave. intake water tunnel 2,500 ft. Estimated cost, \$500,000. F. G. Simmons is commissioner of public

G. Simmons is commissioner of public works.

Saeboygan, Wis.—Water Works Commission plans to install a new boiler and pump at pumping station.

Sheboygan, Wis.—That a water purifier may be secured to filter water used by City of Sheboygan, is thought probable as result of efforts now being made by Dr. H. C. Reich, city health officer. Dr. Reich's proposed plan is to have installed a filtration plant which will inject certain amount of hypochloride into water at pumping station. The hypochloride kills germs in water without having any effect on person drinking it, or upon color of water.

#### CONTRACTS AWARDED.

CONTRACTS AWARDED.

Coolidge, Ga.—For constructing water works to W. H. Goodloe, Macon, Ga. S. C. Nesmith is City Cik.

Rock Island, Ill.—To P. F. Trenkenschuh, city, at \$0.90 per ft. for water main and \$0.60 per ft. for sewer awarded contract for improvement of 21st Ave, between 24th and 25th Sts.

West Frankfort, Ill.—For municipal water system, to Charles S. Laim, St. Louis, Mo., at \$33,000.

Boyden, Ia.—For water system contracts awarded as follows: Adna Dobson, Lincoln, Neb., at \$5,563, for pipe line; Des Moines Bridge & Iron Co., Des Moines, at \$2,650, for tower and tank; Ward & Weighton, Sioux City, at \$1,528, for pump house and drill well; Fairbanks, Morse Co., Chicago, Ill., at \$610, for pump and engine.

Gretna, La.—Representatives of contracting firm of J. W. Sutherlin, of Kansas City, Mo., have arrived in Gretna to begin preparations for commencement of work of laying pipes and installing pump of proposed water works system.

White Castle, La.—For installing water system to American Cast Iron Pipe Co., Birmingham, Ala.

White Castle, La.—By city for following water works contracts: Pipe to American Cast Iron Pipe Co., Birmingham, Ala.; tank and tower, Chicago Bridge & Iron Works, Chicago; engines and pumps, Fairbanks, Morse & Co., Chicago; hydrants and valves, Columbian Iron Works, Chattanooga, Tenn.

Boston, Mass.—For 300 cast iron gate boxes, to Davis Fdry. Co., Lawrence, Mass., at 2%c. per lb.

South Orange, N. J.—For laying water mains in Audley St. and Montague Pl., to Dominick Mercandante.

Neligh, Neb.—To U. S. Supply Co. of Omaha contract for furnishing of materials for water works extensions.

Clucinnati, O.—For concrete water tanks in Kennedy Heights to Ferro Concrete Construction Co., at \$168,747.

Salt Lake City, Utah .- The following types of dams and bids for same are under

consideration:				
Contractor,	Partial	Days to	Full	Add.
Type 1-Arched concrete:	Height	Complete	Height	Days
James Stewart & Co	\$155.812.40	300	\$356,117,00	300
The Utah Construction Company	134,624.20	151	336,551.00	110
Abrams & Ehrhart	125,499.20		302,010.00	125
Bates & Rogers Construction	128,968.50		290,577,50	
Bent Brothers	113,962,00	225	287,600.00	325
Campbell Building Company	109,491.00	270	279,200,00	180
Alston & Hoggan	111,107,80		273,737.10	
Parrott Brothers Company	88,670.10	150	229,368,00	90
P. J. Moran, Contractor, Inc	94,258,05	200	226,212,00	150
Type 2-Ambursen reinforced concrete:	0 1,200.00	200	220,212.00	
James Stewart & Co	201,359.65	300	358,924.50	300
Bates & Rogers Construction Company	168,629,50		308,620.63	
Alston & Hoggan	133,780.41		264,229,81	
Campbell Building Company	123,283,97	270	230,488,18	180
Abrams & Ehrhart	125,781.15	250	227,295.90	. 125
Bent Brothers	117,247.50	225	219,910.25	325
P. J. Moran, Contractor, Inc	117,052,25	200	216,587.11	150
Type 3—Reinforced multiple arch:	111,002.20	200	210,001.11	-
James Stewart & Co	158,844.33	300	315,034.50	200
Bates & Rogers Construction Company	129,129.46		245,952.40	
Campbell Building Company	115,531.10	270	215,354.68	180
Alston & Hoggan	108,582,73	210	208,992.96	
Abrams & Ehrhart	97,339.13	250	176,021.06	125
Bent Brothers		200	168,523.93	325
P. J. Moran, Contractor, Inc	89,039.23	200	152,920.74	150
Parrott Brothers Company	75,298,90	150	138,839.47	150
a mere we would would be a continue of the con	10,200.00	190	100,000.21	

<sup>\*</sup> Not stated

East Liverpool, 0.—To Pitt Construc-tion Co. of Pittsburgh, Pa., at \$52,900 contract by Board of Control for super-structure for new pumping station and filter plant. Chester & Fleming, en-gineers, Pittsburgh, will supervise con-

gineers, Pittsburgh, will supervise construction work.

East Liverpool, 0.—By Board of Control to Pitt Construction Co., Pittsburgh, Pa., for superstructure of pumping station and filter plant at about \$52,000. Chester & Fleming are Engineers, Pittsburgh, Pa.

Fort Worth, Tex.—To Hedges Con-

Fort Worth, Tex.—To Hedges Construction Co., Springfield, Mo., for completing West Fork Reservoir and constructing sewage disposal plant at about \$172,000.

\$172,000.

Berlin, Ont.—By City Council for water system as follows: Canadian-Allis-Chalmers Co., Ltd., King St., W. Toronto, at \$4,492, for pumping machinery; Gartshore-Thompson Pipe & Foundry Co., Stuart St., W., Hamilton, at \$7,074, for piping; Kerr Engine Co., Walker Rd., Walkerville, for valves.

#### LIGHTING AND POWER

Fairhope, Ala.—See "Water Supply."
Pasadena, Cal.—Resolution has been assed by Commission of intention to

Fairhope, Ala.—See "Water Supply."

Pasadena, Cal.—Resolution has been passed by Commission of intention to improve lighting system.

Elgin, III.—E. A. Bell, city electrician, has prepared plans for installation of ornamental lighting system on Charles St. from National St. to Bluff City Blvd.

Indianapolis, Ind.—Indianapolis Light and Heat Co. bid \$14,023 for supplying heat, electric light and power as now provided for courthouse, jail, jail residence, G. A. R. hall and county garage. The Merchants' Heat and Light Co., which has contract this year, submitted contract for the service in 1914, at \$13,989,24. That bid provided the Commissioners have the option of renewing the bid during any of the five succeeding years. Light for detention home was bid for by Indianapolis Co. at \$71 a year, and Merchants' Co. submitted a bid at 18 cts. a kilowatt hour, minimum charge to be \$2.50 a month. Merchants' Co. was the only bidder for an arc light at West Washington St. subway over Eagle creek, its price being \$41.98.

Indianapolis, Ind.—Board of Public Works has granted petition of business men for placing of lighting standards in Maryland St. between Capitol Ave. and Delaware St.

Ft. Dodge, Ia.—Clitzens have voted to issue \$100,000 bonds for power dam in Des Moines River.

Low Moor, Ia.—Election has resulted

Ft. Dodge, Ia.—Citizens have voted to issue \$100,000 bonds for power dam in Des Moines River.

Low Moor, Ia.—Election has resulted in favor of issuing electric light bonds in sum of \$4,500.

Coffeyville, Kan.—Election will be held in near future to vote on question of issuing municipal light plant improvement bonds in sum of \$10,000.

Newport, Ky.—City Solicitor Otto Wolff is drawing up electric light franchise ordinance, Ordinance will provide for electric boulevard lighting system for Monmouth St., from 3d to 11th St. Similar lights will be installed in York St., from 3d to 11th Sts.; Columbia, from 3d to 9th Sts. Lights will be placed at intervals of 90 ft. These lamps cost about \$50 each and original cost of installation is to be paid by property owner. The city will bear all expense thereafter.

Church Point, La.—Citizens are plan-

cr. The city will be thereafter.

Church Point, La.—Citizens are planning to hold election to vote on bonds for electric light plant and water system.

Crowley, Ln.—Bids will be received by city until Dec. 14 for \$35,000 water for \$35,000 electric light and water works bonds. R. J. Boudreaux is City Clerk.

Clerk.

Monroe, La.—Modern lighting of city is being considered.

New Orleans, La.—Bids have been received by dock board for underground conduits, wiring, etc., at municipal dock as follows: Marks Electric Construction Co., \$21,690; Barnes Electric Construction Co., \$21,700; W. A. Dilzell, \$26,900.

Washington, La.—Plans are being discussed for installation of municipal electric light plant.

light plant.
rederick, Md.—City council is con-Sidering plans for enlarging municipal electric light plant at cost of \$103,000. C. L. Reeder, Baltimore, is consulting eng

eer.

1. Mass.—Committee of 11 appointinvestigate advisability of selling
municipal electric lighting plant to
outh Electric Light Co. presented
oort Dec. 1. Proposition to purchase
rrent from an outside company to
tributed by town over its own poles
rires was accepted. Hul! Wev

Westfield, Mass.—By unanimous vote at special town meeting to consider needs of municipal light plant, Town Treasurer George W. Searle was authorized to borrow \$14,000 for the new work. Of that amount \$9,000 will be used for installing new boiler and necessary equipment and \$5,000 for new line of poles, wires and transformers to big plant of Westfield Manufacturing Co. at Lozierville, which has put in order for electric power.

Muskegon, Mich.—The Terrace Street Improvement Association is preparing to install new ornamental street lighting system.

to install new ornamental street lighting system.

Elizabeth, N. J.—Improvements to lighting system along Broad St. are being planned.

Newark, N. J.—Plans are being made to have lighting conditions bettered and crossings improved along Orange St., west of High St.

Newton, N. J.—Town has decided to appropriate \$7,000 for street lighting for year beginning Jan. 1. Town committee will immediately order 112 individual gasolene lights of 500 candle-power each to be forwarded from an Albert Lea (Minn.) firm, which have been ordered for some time.

Brooklyn, N. Y.—Adequate lighting of

(Minn.) firm, which have been ordered (Minn.) firm, which have been ordered for some time.

Brooklyn, N. Y.—Adequate lighting of 9th Ave, is being asked for.

Enid, Okla.—At conference Nov. 29 between G. T. Graden of Tulsa, president of Oklahoma Gas Co.; General Manager Huey of Byllesby Co. of Chicago, the Enid Chamber of Commerce and City Commissioners proposition was submitted and tentatively accepted for piping of natural gas to Enid. Proposition will be embodied in ordinance and submitted to popular vote within next thirty days. The terms of franchise were agreed to by conference and ratification by voters is next step. The gas supply would come from Blackwell fields. Pipe line must be completed in six months, according to proposed franchise.

Goitry, Okla.—On Dec. 21 town will hold special election to vote bonds for electric light and telephone system as per plans of W. L. Benham, the consulting engineer, Oklahoma City, Okla.

Westville, Okla.—Election has resulted in favor of issuing electric light plant bonds in sum of \$10,000.

Eugene, Ore.—Ordinance providing for construction of ornamental lighting system on Ninth Ave. between Pearls and Olive Sts. has been passed.

Brackenridge, Pa.—Municipal electric lightin system is to be installed. S. B. Martin, Pittsburgh, is consulting engl-neer.

Martin, Pittsburgh, is consulting engineer.

Bruce, S. D.—Messrs. Weibers & Schulz have been granted a franchise to install and operate electric light system.

Knoxville, Tenn.—Recorder has been authorized to advertise for bids for new municipal lighting contract to be received up to and including Dec. 31.

Knoxville, Tenn.—Contract for furnishing city lights has expired and Recorder has been instructed to advertise for bids for furnishing city with not less than 600 arc or street lights and the lighting of all municipal buildings.

Superlor, Wis.—Resolution has been passed by Commission authorizing Water, Light & Power Co. to extend water mains on H Ave. from West Second to West Seventh St.

Sarnia, Ont., Can.—The Sarnia city council has voted to submit local option to vote of people in January. A by-law providing for purchase of electric light company's plant also will be submitted. The purchase price would be \$176,000.

#### CONTRACTS AWARDED

Little River, Kan.—For the installation of a municipal electric light plant to F. D. Martin Co., Rialto Building, Kansas City, Mo., at \$15,163. W. R. Rollins & Co., Midland Building, Kansas City, Mo., are engineers.

Bay City, Mich.—By Bay City Electric Light Department to Babcock & Wilcox Mfg. Co., for 600 hp. boiler and three Jones underfeed stokers. The department is also in the market for a 20-in strainer wor its suction line and also for a multi-stage centrifugal motor driven pump for boiler feed. W. H. Fitzhugh is superintendent.

Kansas City, Mo.—Board of public works has commissioned firm of Harrington, Howard & Ash to work in conjunction with Curtis Hill, city engineer, in drawing plans for Missouri side portion of Twenty-third St. Traffic Way viaduct. It will take at least three months to prepare the plans.

Bayonne, N. J.—Plans are being dis-

cussed to erect a bridge to be known as Newark Bay Bridge to replace present structure of Central Railroad Company. Cost will be shared in fair proportion between State, railroad and Hudson and Union Counties.

Perth Amboy, N. J.—The New Jersey ate Engineer approved resolution callig for bids for planking for Amboy ing fo bridge.

Hudson, N. Y.—Joseph Walsh, local electrician, has been awarded contract to install electrical system in new jail here, and it is understood that he will begin work at once. Mr. Walsh's bid was \$570.

Windom, Tex.—Board of Trade has contracted with Texas Power & Light Co. to put in street lights at this place.

Bloomington, Wis.—To Globe Electric Co., Milwaukee, awarded contract for electric light plant in Bloomington.

#### FIRE EQUIPMENT

Bridgeport, Conn.—Steps towards installation of improved fire alarm system were taken by members of the Board of Fire Commissioners at their regular meeting Dec. 1 Present system, although one of best automatic systems in the country, is inadequate and the commissioners are planning to install system that will cost city \$25,000, but which will be serviceable for 50 years to come. The proposed system is manual and automatic, such as is in commission in larger cities.

Champaign, III.—Business men are urging the installation of fire alarm system in business section.

Pekin, III.—Resolution has been introduced authorizing commission of public health and safety to advertise for bids for combination fire truck and chemical wagon and an ambulance and patrol.

Streator, III.—Immeriate action will be taken by purchasing committee and members of council to dispose of motor bonds and hurry the purchase of the motor fire equipment for this city.

Cherokee, Kan.—City is planning to purchase new apparatus for local department.

Boston, Mass.—Council voted \$1,070 additional for repairs to house of Ladder Co. 4, and \$3,751 additional for Engine Co. 16. Additions bring appropriations practically up to architect's estimates, which had been cut down by finance commission. Appropriations will now stand \$15,761 for ladder house and \$15,700 for engine house.

mates, which had been cut down by finance commission. Appropriations will now stand \$15,751 for ladder house and \$15,700 for engine house.

St. Joseph, Mich.—Installation of fire whistle at pumping station is being discussed.

whistie at pumping station is being discussed.

St. Paul, Minn.—City is planning to purchase new switchboard for Central Fire Alarm Station, to cost about \$2,000, and also 35 alarm boxes, to cost about \$4,375.

and also 35 alarm boxes, to cost about \$4.375.

Brookhaven, Miss.—Council is discussing purchase of motor combination chemical and hose wagon.

Webster Groves, Mo.—Bond issue of \$20,000 is being considered to provide better fire protection.

Long Branch, N. J.—Ordinance is being considered for purchase of automobile city service hook and ladder truck, automobile hose wagon, combination automobile hose and chemical wagon and automobile run-about.

Rahway, N. J.—Purchase of motor fire apparatus and erection of central fire house have been recommended.

Newark, N. J.—Bids which Fire Board had received for 2,000 ft. of hose at last regular meeting were all rejected on Dec. 1 at special meeting.

Albany, N. Y.—Contracts will be let on Dec. 6 for construction of fire alarm headquarters.

Binghamton, N. Y.—Communication

Albany, N. 1.

on Dec. 6 for construction of fire alarm headquarters.

Binghamton, N. Y.—Communication was read from Fire Commissioner Frank E. Woodruff stating that contract for \$9,000 worth of Fire Department equipment to be placed in new central fire

sy,000 worth of Fire Department equip-ment to be placed in new central fire station awarded to Star Electric Co. had been transferred to Gamewell Co. Inwood, N. Y.—Purchase of motor com-bination chemical and hose wagon is be-ing planned. Charles H. Bowker is ing planned. Chief.

Chief.

Rochester, N. Y.—Plans for a fire alarm system for borough of Charlotte are under consideration.

Westfield, N. Y.—Lively interest is being taken in special election to be held here on Dec. 14, for purpose of voting upon proposition for purchase of two auto trucks for Fire Department, at maximum cost of \$3,000.

Lima. 0.—Sum of \$15,000 has been provided for motorized fire apparatus, and

34,000 for erection of two new fire sta-

\$34,000 for erection of the tions.

Cheltenham, Pa.—Funds are being raised by Fire Company No. 1 to purchase a motor pumping engine.

Linerch, Pa.—Fire company is endeavoring to raise funds for purchase of the equipment.

Committee from the

deavoring to raise runds to new equipment.

Port Carbon, Pa.—Committee from the Good Will Hose Co. has asked for a special election to vote on \$5,000 loan to make up \$6,000 required to buy fire apparatus. Committee has recommended Waterous motor truck without

to make up \$6,000 required to buy fire apparatus. Committee has recommended Waterous motor truck without chemical attachment.

Warwick, R. I.—Plans have been received for erection of 2-story fire station to be erected by Conlmicut Volunteer Fire Co.

Knoxville, Tenn.—City is planning to buy a compound motor truck and engine.

Knoxville, Tenn.—Budget for 1916 calls for appropriation of \$15,000 for motor equipment for fire and other departments of city, which city will be in market for after first of year.

Knoxville, Tenn.—Sum of \$15,000 to be used in purchasing motor equipment and other supplies for city fire and police department has been appropriated.

Arlington, Va.—Committee will investigate cost of fire engine and other apparatus, with view to purchase.

#### CONTRACTS AWARDED.

Pomona, Cal.—To American-La France Co., of Elmira, N. Y., for motor combina-tion chemical and hose wagon, with 1,200 feet of hose.

tion chemical and nose wagon, with 1,200 feet of hose.

San Jose, Cal.—To the Republic Rubber Co. for 1,800 ft. of hose at 80 cts. per ft., and to the United States Rubber Co. for 1,200 ft. of hose at \$1.12.

Venice, Cal.—Contract has been awarded to American-La France Fire Engine Co. of Elmira, N. Y., for one combination hose and chemical wagon with Junior pump to cost \$6,000. Geo. A. Hubbard, Chief Engineer.

New London, Conn.—To Seagrave Company through D. Arthur Burt & Co., Eastern Representatives, for one motor city service truck.

service truck. BRIDGES

BRIDGES

Charlotte, N. C.—For 2,000 ft, of fire hose to Baltimore office of Fabric Fire Hose Co. of New York.

Bellaire, O.—By city, contracts for one Peerless combination chemical and hose wagon, one Seagrave combination chemical and hose wagon, with 1,500 ft. of hose, one Seagrave triple combination pumping engine with 1,000-gal. capacity centrifugal pump, 40-gal. chemical tank, 1,500 ft. of hose.

Oklahoma City, Okla.—For furnishing the city with 5,000 ft. of fire hose, to the Ed. M. Seamans Co., at 80c, per ft. Antigo, Wis.—To the Seagrave Co., of Columbus, O., for a motor truck at \$5,-600.

#### BRIDGES

BRIDGES

Jacksonville, Fla.—Committee has decided to request City Council to appropriate \$3,000 for bridges. Of this amount, \$1,500 will be used to construct new concrete bridge at Eagle St. and Hogans Creek and remaining \$1,500 for repair to other bridges, which are now posted as dangerous.

Indianapolis, Ind.—Three bids were submitted for providing lumber for bridge repair. These follow: Albert F. Zearing Contractors' Supply Co., \$1,-128.94: Maas-Neimeyer Lumber Co., \$968.38; James C. Dickson, \$891. Three bids for paint and brushes for repainting the bridges in county were by Zearing Co. for \$174.50. Indianapolis Paint & Color Co. for \$171, and Advance Paint Co. for \$152.70.

Indianapolis, Ind.—Board of Public Works has approved plans for acquisition of property for lengthening approaches to bridge across White river at Oliver Ave.

Portland, Ind.—Creosote blocks are to be used as covering for bridge across Salamonia river. Bridge is 100 ft. long and blocks are to be laid 18 ft. wide to correspond with balance of improvement. Viewers recommend that Commissioners take proposition of establishing underground passage beneath railroad up with Indiana Public Service Commissioners take proposition of establishing underground passage beneath railroad up with Indiana Public Service Commissioners take proposition of establishing underground passage beneath railroad up with Indiana Public Service Commissioners take proposition of establishing underground passage beneath railroad up with Indiana Public Service Commissioners take proposition of constructing 30-ft. I-beam bridge, 18-ft. roadway, concrete floor and abutments, and two 20-ft. I-beam

bridge, 18-ft. roadway, concrete floor and abutments. Henry Klaus is county engineer, Manchester.

Topeka, Kan.—It has been decided to repair the East 6th St. viaduct at cost of between \$30,000 and \$35,000.

Lawrence, Mass.—Mayor Kane has recommended to City Council that loan of \$300 be authorized for completion of the central bridge.

St. Joseph, Mich.—At a session of the Benton Harbor City Council it was decided to submit the bonds for the building of the viaduct to the people at a special election to be held soon.

Cairo, N. Y.—Election has resulted by vote of 280 to 185 in favor of issuing bridge bonds in sum of \$3,000. Henry Chadderdon is town clerk.

Fairfield, N. Y.—Concrete bridge will be constructed in the spring over Maultanno Brook. Address Charles N. Richardson, Fairfield.

Perry, N. Y.—Question of re-building Borden Ave. bridge in this village has been taken up by town board. Bridge was condemned recently by State Highway Department and estimated cost of new bridge is about \$6,000.

Schenectady, N. Y.—Construction of bridge across Mohawk River from foot of State St. to Mohawk Ave., Scotia, is recommended.

Silver Creek, N. Y.—Two concrete bridges will be erected in Silver Creek to cost about \$14,500.

Dayton, O.—Bonds in sum of \$115,000 have been voted by citizens for Mad River and Keewee St. bridge.

Sandusky, O.—County Commissioners have asked for bids for the repair of the river bridge at Vermilion. The board will receive bids for the labor and material necessary in reflooring the structure Dec. 13. The following day bids will be received looking to the repair of bridge M-212, Milan township. The board is planning an extensive bridge repair course for the coming year.

Salem, Ore.—Decision has been reached at meeting between Marion and Polk

year.

Salem, Ore.—Decision has been reached at meeting between Marion and Polk county courts to construct new bridge across Willamette River here. Present bridge has been condemned by engineers, but will be repaired, and used under strict traffic regulations, until new one can be built. Kind of bridge, and its location, are to be decided upon later.

new one can be built. Kind of bridge, and its location, are to be decided upon later.

Harrisburg, Pa.—First action by Council on \$300,000 loan for Walnut St. viaduct, passed at last election by small majority. Preparation of plans and specifications for proposed structure will be introduced.

Johnstown, Pa.—Action looking to erection of handsome concrete bridge, replacing worn-out Moxham span, at cost of \$75,000 has been taken by Council at special meeting.

Johnstown, Pa.—Sealed proposals will be received at office of City Treasurer until 12 o'clock Monday, Dec. 13, 1915, for purchase of \$50,000 Horner St. bridge bonds of 1915.

Pittsburgh, Pa.—Bond issue will be voted on April, 1916, the amount not to exceed \$60,000, for a new steel bridge over Greenfield Ave.

Sunbury, Pa.—Northumberland County. Commissioners announced Nov. 30 that they plan to finance the erection of a bridge across the Susqehanna River at Watsontown to White Deer. They will have the structure erected and opened as soon as possible.

Woonsocket, R. I.—See "Streets and Roads."

Knoxville, Tenn.—City Commis will shortly take action to consider visability of issuing \$125,000 viaconds. Commission

visability of issuing \$125,000 viaduct bonds.

Galveston, Tex.—County engineer has been instructed to look into matter of rebuilding bridge over Sydnor's bayou, down island, and report probable cost.

Senttle, Wash.—Following bids have been received for 23d Ave. West bridge: P. Manson, \$5,787: J. A. McEeachern Co., \$6,643; Weymouth Const. Co., \$7,011: Lester & Monohan, \$7,133; C. Geske & Co., \$7,361.60; H. A. Cotton, \$8,754.10.

Prairle du Sac. Wis.—Plans are being prepared by M. W. Torkelson, bridge engineer, State Highway Commission, Madison, for bridges across Wisconsin River at Prairie du Sac to cost about \$75,000.

#### CONTRACTS AWARDED.

Bakersfield, Cal.—To Robert Sherer Co., Pacific Electric Bidg., Los Angeles, at \$13.465 for bridges and culverts on Division 10, Section 7, Bakersfield-Mojave Rd.

Los Angeles, Cal.—For constructing 60-ft. plate girder bridge with concrete floor and abutments over San Jose Creek, on Lemon Grove Ave., to Edgar T. Wheeler Co., at \$7,190.

Sacramento, Cal.—The Holland Construction Co. of San Diego was awarded contract Nov. 23 for construction of reinforced concrete bridge across Meyers Creek in Imperial County.

Hartford Comp.—For reinforced conc.

Hartford, Conn.—For reinforced concrete bridges and widening of causeway in Haddin Township, to Donahue Bros., Middletown, \$6,217.

Newton, Kan.—Board of County Commissioners have awarded contract for work on the county bridges to Mr. Marshall of Walton.

Kingsfield, Me.—To Saunders Engineering Co., Portland, at \$15,000, contract for reinforced concrete bridge over Carrabasett River.

tract for reinforced concrete bridge over Carrabassett River.

Kennet Square, Pa.—For stone arch bridge over Red Clay Creek, to P. J. Mc-Cormic & Son, West Chester, at \$5,598.

Woonsocket, R. I.—Board of Aldermen has awarded contracts for building two Hamlet Ave. concrete bridges, which will replace wooden structures, to E. W. Foley Construction Co., of New York. The bid was \$71,886. Board awarded contract for building the Fairmount concrete bridge to the Spaulding Construction Co., of Suffield, Conn., for \$21,812.75. \$21.812.75

Canadian, Tex.—Commissioners' Court has relet contract for building of bridge across Canadian River at this point to Canton Bridge Co. for \$71,000. Other contract was for \$67,710. The last contract calls for a more substantial substantians. structure.

Livingston, Tex.—By city to construct 7 concrete and steel bridges and 2,000 ft, corrugated iron culverts to J. G. Browne Co. of Houston.

#### MISCELLANEOUS

Camden, Ala.—Election will be held Dec. 6 to vote on question of issuing following bonds: Water works, \$1,500; sewer, \$2,250; street improvement, \$4,-

Richmond, Cal.—Plans are being discussed for a new city hall at Nevin Ave. and 25th St.

cussed for a new city hall at Nevin Ave. and 25th St.

San Francisco, Cal.—The Board has approved plans for the structural steel for the northeast and southeast wings of the San Francisco Hospital and will receive bids on Dec. 8.

San Francisco, Cal.—Six bids for construction of Hetch-Hetchy K. R. were received and opened Nov. 24 by Board of Works, lowest being filed by F. Rolandi. They were referred to City Engineer for examination. He is to report on them in few days. Unit prices on more than 50 items were given in bids. The totals, which were not appended, will be figured up by City Engineer. Bidders were: Porter Bros. Co.; Mason & Hangar Co., representing New York contractors; Utah Construction Co.; Tibitts Pacific Co. and Twohy Bros. Co., and Rolandi Co. City Engineer O'Shaughnessy, who estimated cost of railroad at \$1,700,000, said that bids appeared satisfactory. The road is to be built from Rosasco to Hetch-Hetchy dam site, 67 miles.

San Mateo, Cal.—City Trustees Eva

miles.

San Mateo, Cal.—City Trustees Eva and Simmen have been selected to interview owners of beach property and find out what price will be asked if city decides to buy same for municipal bath resort. W. H. Toepke has submitted plans for improvements estimated to cost \$50,000, which would include wharf, bathhouse, breakwater, bathing pavilion, ball park and playground and parking spaces between.

Pekin, III.—Resolution has been intro-

ball park and playground and parking spaces between.

Pekin, III.—Resolution has been introduced authorizing commissioner of public health and safety to advertise for bids for ambulance and patrol.

Fort Wayne, Ind.—Garbage Crematory is to be constructed on Clinton St. as central plant. The board of works will this afternoon order advertisements for bids for collection of garbage during the year 1916.

Richmond, Ind.—William Haberkern has agreed to purchase \$25,000 worth of bonds in event city officials decide to adopt plan proposed by So. 6th St. merchants to build new market house and auditorium on corner of 6th and So. A Sts.

Louisville, Ky.—Board of public works will purchase eight new bottom dump wagons to be added to street cleaning department upon recommendation of Supt. William Shumate.